

Prevalence of Suicide Risk Factors among Emergency Medical Services Providers in Utah

Gordon Mills, RN, BSN

University of Utah

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## Executive Summary

Emergency Medical Services (EMS) providers suffer a higher rate of suicide than the general population. National statistics show an age adjusted rate of 13.0 suicides per 100,000 in the general population. However, EMS providers have been shown to have suicide rates of 17.2 to 30.5 suicides per 100,000. Due to the alarmingly high rate of suicide among EMS providers, understanding the risk factors specific to this cohort is vital in preventing suicide.

EMS providers face the same suicide risk factors as the general public based on gender, age, and co-morbid psychiatric disorders. However, there appears to be additional risk factors for EMS providers which work synergistically to increase suicide risk. These additional risk factors are post-traumatic stress disorder (PTSD), alcohol abuse, and access to lethal means.

The literature supports high rates of PTSD and alcohol abuse among EMS providers nationally. Evidence shows that EMS providers suffer PTSD rate up to 8 times that of the general population. Alcohol abuse among EMS providers is 5 times that of the general population. Finally, access to lethal means is a known risk factor for completed suicides. Access to firearms is highly associated with completed suicides, with over 60% of suicides in the United States completed by firearm. There is a deficiency of prevalence data for PTSD, alcohol abuse, and access to lethal means among Utah EMS providers. A few local departments have conducted short surveys collecting some data about PTSD. No published data exists examining all three risk factors together.

The purpose of this project was to collect suicide-related prevalence data regarding PTSD, substance abuse, and access to lethal means from Utah EMS providers. The project was accomplished through the following objectives: (1) collaboration with Utah EMS providers and stakeholders to develop a survey plan, (2) development and implementation of the survey of Utah EMS providers, (3) analysis of the data for significant findings, and (4) dissemination of the findings to EMS stakeholders who are in position to take action on the data. Evaluation of these steps was accomplished through successful development of the survey, timely conduction of the survey, and dissemination of the results and suicide prevention resources to stakeholders.

Over 1,300 licensed Utah EMS providers participated in the survey. A significant portion (25.5%) of participants met American Psychological Association criteria for PTSD. However, substantially more (55.6%) exhibited symptoms of PTSD. Utah EMS providers had a higher rate of risky alcohol use than the general population (12% v. 8%). Lastly, a substantially high proportion of providers had access to firearms (76%) and high-risk medications.

Risk factor prevalence data is a foundational key in the prevention of suicide. Suicide-related risk factor prevalence data is sorely lacking among Utah EMS providers. This is a group of individuals who are not accustomed to asking for help. Therefore, collecting this data will aid in the development of further discovery and intervention programs to assist those who dedicate their lives in assisting others.

The committee for this project was Dr. Michael Johnson, project chairperson, Dr. Julie Balk, program director, and Dr. Pam Hardin, Assistant Dean for MS and DNP programs. A special acknowledgement to Dr. Richard Landward, a content expert who is passionate about suicide prevention among EMS providers.

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## Prevalence of Suicide Risk Factors among Emergency Medical Services Providers in Utah

### **Problem Statement**

Emergency Medical Services (EMS) providers deliver high-quality, life-saving services for medical and traumatic emergencies on a moment's notice. These services can be emotionally distressing for EMS providers as they witness illness, injury, and death among children and adults. Repeated exposure to these events can result in negative psychosocial consequences such as post-traumatic stress disorder (PTSD), substance abuse, and suicidality.

Despite these known risks, there is a deficiency of prevalence data for PTSD, substance abuse, and access to lethal means of suicide among EMS providers in Utah. Prevalence data is used to establish morbidity, predict mortality, guide future research, obtain funding, and influence policy. Without this valuable data, development of effective prevention and treatment programs will be frustrated.

### **Clinical Significance**

Suicide remains a top ten leading cause of death among all age groups in the United States. Nationally, the age-adjusted suicide rate is 13.0 per 100,000 (Kochanek, Murphy, Xu, & Tejada-Vera, 2016). In Utah, the age-adjusted rate of suicide is a startling 20.8 per 100,000, the fifth highest rate among states in the United States (Centers for Disease Control and Prevention, 2014). That translates to 603 deaths per year in Utah, based on a population of 2.9 million (U.S. Census Bureau, n.d.).

Not only are completed suicides tragic and costly, but attempted suicides can have an enormous impact on families, friends, co-workers and communities. Many suicide attempts result in non-fatal injuries requiring medical attention (Shepard, Gurewich, Lwin, Reed, & Silverman, 2016). Families and communities are left with economic, social, and psychological

burdens as well as long-term disability from non-fatal injury (World Health Organization, 2014). The death of a fellow EMS provider can add to the psychological stress of surviving EMS co-workers, thus increasing their overall risk for negative psychosocial effects.

Suicide prevention is a priority of the US Surgeon General's Office and Healthy People 2020 (Office of the Surgeon General & National Action Alliance for Suicide Prevention, 2012; US Department of Health and Human Services, 2016). As part of the US Surgeon General's National Strategy for Suicide Prevention, goal 11 focuses on surveillance systems and timely reporting of suicide-related data. Surveillance data is used to understand the depth of the problem, identify those at high-risk for suicide, and guide public health actions. Therefore, prevalence data for EMS providers is essential for understanding the scope of risk factors and suicidality among this high-risk group.

### **Purpose**

The goal of this project is to collect prevalence data regarding PTSD, alcohol abuse, and access to lethal means of suicide among EMS providers in Utah.

### **Objectives**

The goal of this project will be accomplished through the following objectives:

1. Collaborate with stakeholders including EMS leaders, EMS providers, and a content expert to develop a plan for collecting prevalence data from urban EMS providers in Utah.
2. Develop a survey for use in collecting prevalence data from EMS providers.
3. Conduct a survey of Utah EMS providers.
4. Analyze data collected from the survey of EMS providers.
5. Disseminate findings to EMS leaders and other major EMS stakeholders.

## **Literature Review**

### **Epidemiology**

The epidemiology of suicide is important to establish among all populations and subgroups. Likewise, understanding the various risk factors for suicide among populations of interest aids in focused development of prevention and treatment strategies. The epidemiology of suicide among EMS providers has been documented, but remains unclear due to vague categorization of EMS provider jobs, under-reporting of EMS providers suicide, or mis-categorization of EMS provider cause of death (often done as a “professional courtesy” to the EMS provider and their family).

However, the literature fails to reveal the epidemiology of known suicide risk factors among the EMS population in general, and more specifically among Utah EMS providers. The focus of this project is to collect these suicide risk factor data from Utah EMS providers. Establishing the prevalence of PTSD, alcohol abuse, and access to lethal means is a preliminary step in addressing suicide among the EMS providers.

### **Suicide**

Despite national efforts to reduce suicide morbidity and mortality, suicide remains a leading cause of death in the United States. In 2014, 42,773 individuals completed suicide resulting in an age-adjusted rate of 13.0 per 100,000 (Kochanek et al., 2016). Utah has consistently been above the national average for suicide. In 2014, 559 Utahans completed suicide at an age-adjusted rate of 20.5 per 100,000. Nationally, suicide ranks as the tenth most common cause of death for all age groups; while in Utah, it ranks eighth (Kochanek et al., 2016; Utah Department of Health, 2015).



Epidemiologic data for suicide among EMS providers is unclear. Using the Centers for Disease Control and Prevention's National Violent Death Reporting System data, the suicide rate for EMS providers was 17.4 per 100,000 among healthcare practitioners and technical occupations (McIntosh et al., 2016). However, EMS providers such as emergency medical technicians and paramedics were categorized in the same group as physicians, nurses, and dentists. Another group, protective service occupations, had a suicide rate of 30.5 per 100,000. The protective service occupations group included firefighters, police officers, game wardens, and parking enforcement workers. It is worth noting that nearly all firefighters in urban metropolitan areas of Utah are also EMS providers. It is unclear into which group dual certified (EMS and firefighter) providers were included. Additionally, firefighters and EMS providers were grouped with other occupations which are known to be high-risk for suicide such as police officers (Violanti, 2010) and physicians (Gold, Sen, & Schwenk, 2013).

#### **Post-traumatic stress disorder**

Full and partial PTSD prevalence was 6.4% and 6.6%, respectively, in a nationally representative study of the general population (Pietrzak, Goldstein, Southwick, & Grant, 2011). Lifetime PTSD risk estimated from the US National Comorbidity Survey Replication was 5.7% (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012).

Post-traumatic stress disorder plays a significant role in suicidality among EMS providers. The prevalence of PTSD in EMS providers and firefighters has been documented in the literature (Javidi & Yadollahie, 2012; McFarlane, Williamson, & Barton, 2009; Skogstad et al., 2013). Prevalence estimates from these studies range from 20% to 32%. One study of worldwide PTSD risk among rescue workers found the pooled prevalence at 10% (Berger et al., 2012). Other studies have found the incidence of PTSD among EMS workers between 12 and

20% (Sterud, Ekeberg, and Hem, 2006). Based on this data, the rate of post-traumatic stress disorder among EMS providers appears to be three to four-fold higher than the general population.

Avoidance and alterations in emotions are some of the possible manifestations of PTSD (American Psychiatric Association, 2013). Individuals risk becoming emotionally desensitized to death and dying as a result of repeated exposure to these events. Fear of death and dying stands as a barrier to taking one's own life in most people. However, those who have become desensitized to death and dying do not have such a barrier which can make the decision of suicide easier.

### **Alcohol abuse**

In 2014, approximately 20.2 million (8.4%) adults in the United States had a substance abuse disorder (Hedden, Kennet, Lipari, Medley, & Tice, 2015). The data from Hedden et al. (2015) revealed that 10.8% of young adults (aged 18-25) and 6% of adults (aged 26 or older) reported heavy alcohol use. The National Institute on Alcohol Abuse and Alcoholism (2017) also reported that 6.2% of adults aged 18 or older have an alcohol use disorder. Alcohol abuse is of particular concern in EMS suicidality because of its relative availability and it is legal to purchase.

Alcohol abuse rates in two studies found alarmingly high rates of abuse among firefighters. In the first study, Haddock et al. (2012) found that 58% of career firefighters and 40% of volunteer firefighters drank heavily on days they did drink. A second study found similarly high rates of alcohol abuse among career firefighters (Haddock, Day, Poston, Jahnke, & Jitnarin, 2015). These statistics for firefighters are relevant to the EMS provider population in Utah because the majority of EMS providers are also firefighters.

Alcohol abuse is problematic due to the potential for impulsivity when drinking. Hazardous drinkers have higher levels of impulsivity and risky behaviors (Hamilton, Sinha, & Potenza, 2012; Potenza & de Wit, 2010). Impulsivity combined with desensitization to death and dying from PTSD are a toxic combination with the potential for a completed suicide.

### **Risk Factors**

Emergency medical services are repeatedly exposed to stressful events such as medical emergencies and traumatic injuries among the general population. This exposure to psychologically traumatic events is often termed critical incident stress. Critical incident stress is defined as “stressful workplace incidents that evoke acute distress and which may impair functioning in the short- or long term” (Halpern, Maunder, Schwartz, & Gurevich, 2012, p. 1). Chronic and acute critical incident stress has been associated with post-traumatic symptomology (Donnelly, 2012; Donnelly, Bradford, Davis, Hedges, & Klingel, 2016). Emergency medical services providers encounter daily stressful incidents which can impair their ability to function in the job and lead to mental health disorders such as PTSD.

Exposure to these events may lead to many negative psychosocial effects which can result in suicidality. Repeated exposure to trauma leads to numerous possible negative health effects including depression, anxiety, adjustment disorder, physical ailments, drug and alcohol abuse, desensitization to death and dying, and PTSD (Harvey et al., 2016; Jahnke, Poston, Haddock, & Murphy, 2016).

Post-traumatic stress disorder has been strongly associated with suicidal ideation and suicide attempts (Guerra & Calhoun, 2011; Krynska & Lester, 2010; Pompili et al., 2013; Sareen, Houlahan, Cox, & Asmundson, 2005). More importantly, PTSD with co-morbid alcohol abuse is associated with increased suicide attempts (Blanco et al., 2013). Older studies have

shown consistent relationships between PTSD and alcohol use or misuse with suicidal attempts, ideations, or completions (Arsenault-Lapierre, Kim, & Turecki, 2004). Newer studies of war veterans are consistent with the same associations (Jakupcak et al., 2011; Maguen et al., 2015). A plethora of data exists in the literature establishing associations between PTSD and alcohol abuse to suicidality, but there is scant evidence of this within the EMS community.

Gender has been known to play a role in PTSD in the general population with women experiencing higher rates than men (Pietrzak, et al., 2011). However, Berger et al. (2012) found no gender difference in prevalence among female and male rescuers. Likewise, there was no difference in PTSD prevalence between professional and non-professional rescuers. Lastly, Berger et al. (2012) discovered no significant difference in PTSD prevalence between rescuers involved in a major disaster compared to rescuers exposed to day-to-day traumatic events of lesser significance.

### **Impact of Suicide**

Suicidal ideation, suicide attempts, and completed suicides have enormous impact on adolescents, families, and communities. Suicide attempts result in costs associated with medical treatment, mental health treatment, and lost productivity (Shepard et al., 2016). In 2013, suicides and suicide attempts in the United States cost \$58.4 billion dollars based only on reported events. If adjusted for under-reporting, the estimated costs rose to \$93.5 billion. These costs include care for chronic injury and illness as a result of failed suicide attempt.

Even more distressing are the emotional and psychological costs related to incomplete suicides and completed suicides for victims and their families. Survivors of both incomplete and completed suicide experience an array of emotions including grief, anger, guilt, abandonment, shock, hopelessness, helplessness, and denial (American Association of Suicidology, n.d.). These

emotions can lead to life-long stress, anxiety, and distress. It also adds to psychosocial distress among surviving EMS providers who were close to the suicide victim.

### **Suicide Prevention**

Due to the scope and nature of suicide, prevention strategies are the focus of many local, state, and national health initiatives. Strategies are directed toward individuals, families, target groups, and communities. Suicide is a multifaceted problem which requires a multifaceted prevention approach. Therefore, evidence-based prevention strategies from expert and government sources target multiple areas to remove risk factors and promote protective factors.

A starting point in suicide prevention would be surveillance of accurate and timely suicide-related data (Office of the Surgeon General & National Action Alliance for Suicide Prevention, 2012). Collecting prevalence data from EMS providers in Utah will help channel valuable resources in developing treatment and prevention programs. In addition, these prevalence data will be invaluable in guiding future research to keep EMS providers healthy and safe.

### **Theoretical Framework**

Syndemic theory was developed by the medical anthropologist Merrill Singer (Singer & Clair, 2003). It is a public health theory based on the idea that a negative health outcome does not occur in a vacuum. Instead, negative health outcomes result from synergistic interactions between two or more health or disease factors confounded by social or cultural factors. For example, an individual who does not exercise but lives an otherwise healthy lifestyle may never have heart disease. However, an individual who eats poorly, smokes, has a family history of heart disease and who does not exercise may likely develop heart disease. It is the synergistic effects

of all the health or disease indicators which lead to negative outcomes according to the syndemic theory.

An expert in EMS provider PTSD and suicide has reported a trifecta of risk factors in EMS provider suicidality (personal communication, 2016). This trifecta is composed of impulsivity (a result of alcohol abuse), desensitization to death and dying (a component of PTSD), and access to a lethal means of suicide. The combination of these three suicide risk factors is consistent with the principles of the theoretical framework. In syndemic theory, these multiple suicide risk factors work synergistically in leading to a negative outcome for EMS providers (see Figure 1).

**Implementation and Evaluation Plan**

<b>Objective #1</b>	<b>Implementation</b>	<b>Evaluation</b>
Collaborate with stakeholders including EMS leaders, EMS union, EMS providers, and a content expert to develop a plan for collecting prevalence data from urban EMS providers in Utah.	<ol style="list-style-type: none"> <li>1. Obtain appointments to meet with key stakeholders in EMS services in Utah and content expert.</li> <li>2. Review current project plan for data collection and make amendments to the plan per recommendations by stakeholders.</li> <li>3. Finalize the plan for data collection and implementation.</li> <li>4. Apply for IRB approval for the study.</li> </ol>	<ol style="list-style-type: none"> <li>1. Appointments acquired for stakeholders.</li> <li>2. Stakeholder permission to implement project in their departments obtained.</li> <li>3. Finalized, written plan for data collection and implementation.</li> <li>4. IRB approval obtained.</li> </ol>
<b>Objective #2</b>	<b>Implementation</b>	<b>Evaluation</b>
Develop a survey for use in collecting prevalence data from EMS providers.	<ol style="list-style-type: none"> <li>1. Develop an electronic survey for collecting demographic data.</li> <li>2. Choose a validated PTSD screening tool for use in the survey.</li> </ol>	<ol style="list-style-type: none"> <li>1. Have a finalized, written survey including screening tools.</li> <li>2. Survey and screening tools approved by</li> </ol>

	<ol style="list-style-type: none"> <li>3. Choose a validated alcohol use/misuse screening tool for the survey.</li> </ol>	<p>stakeholders and IRB.</p> <ol style="list-style-type: none"> <li>3. Transfer written survey to REDCap for electronic use and distribution.</li> </ol>
<b>Objective #3</b>	<b>Implementation</b>	<b>Evaluation</b>
<p>Conduct the survey of EMS providers and analyze the data.</p>	<ol style="list-style-type: none"> <li>1. Obtain email lists or agency contacts from individual EMS agencies.</li> <li>2. Distribute the survey link via email to EMS providers.</li> <li>3. Re--submit survey request to any potential subjects who did not respond to initial survey after two weeks.</li> <li>4. Collect data from REDCap.</li> </ol>	<ol style="list-style-type: none"> <li>1. Email lists obtained.</li> <li>2. Survey distributed via email lists.</li> <li>3. Re-submission of survey after two weeks to non-respondents.</li> <li>4. Data collected and documented from REDCap survey, continuous until survey closes.</li> <li>5. Data analyzed and results recorded within two weeks of survey closure.</li> <li>6. Use descriptive statistics on MS Excel to determine prevalence of suicide risk factors.</li> </ol>
<b>Objective #4</b>	<b>Implementation</b>	<b>Evaluation</b>
<p>Disseminate findings to EMS leaders and other major stakeholders.</p>	<ol style="list-style-type: none"> <li>1. Email results to EMS leaders and major stakeholders.</li> <li>2. Email results to content expert.</li> <li>3. Select suicide related health and prevention materials based on risk factors identified in project.</li> <li>4. Provide materials from #3 to EMS stakeholders.</li> </ol>	<ol style="list-style-type: none"> <li>1. Results emailed to stakeholders within one month or project completion.</li> <li>2. EMS leaders and providers acknowledge receipt of project data.</li> <li>3. Provide suicide related health and prevention materials based on risk factors to EMS stakeholders.</li> </ol>

### **Implementation**

A project proposal was presented to the University of Utah College of Nursing faculty and approved (see Appendix A for the project proposal presentation slides). Objectives one and two were implemented simultaneously. Meetings with stakeholders were scheduled at the same time the survey was being developed. Additionally, a University of Utah Institutional Review Board (IRB) application was completed.

Multiple EMS agencies were contacted for recruitment into the project. The fire agencies were very protective of the confidentiality of their email lists. Therefore, they would not allow access to the lists for this project. Since most firefighters in Utah are dual certified as EMS providers, it was quickly determined that dissemination of the survey would be accomplished most efficiently through the firefighter's union.

At a meeting with one of the largest fire agencies in the Greater Salt Lake area, the union president requested the project be presented to the state level of the firefighter's union. The project and survey were presented to the firefighter's union committee. The state union president offered to act as a primary contact for the survey. He planned to utilize the levels of leadership within the union organization to spread the survey to individual EMS providers.

The state union committee did request two changes to the original demographics screening plan. They requested that professional versus volunteer status be determined and how many fire/EMS jobs the participants held. The latter request was interesting, as it may indicate increased exposure to traumatic events. The two demographics changes were submitted to the IRB as an amendment.

One week into the survey period, a meeting was facilitated with the EMS Program Director for the State of Utah. The project was presented to him and he offered to use his



resources to send the survey directly to each licensed EMS provider in the State of Utah. This enhanced the ability to capture survey responses from EMS providers who were non-union firefighters, professional EMS providers who are not dual certified as firefighters, volunteer EMS providers, and rural EMS providers.

A search of the literature for validated PTSD, alcohol abuse, and access to lethal means screening tools was done. Advice was also received from the project chair and content expert as to which screening tools would generate the best data. The PCL-C (see Appendix B) has been well-studied for its validity and reliability (Conybeare, Behar, Solomon, Newman, & Borkovec, 2012). The PCL-C is based on DSM-IV-TR (American Psychiatric Association, 2000) criteria for the diagnosis of PTSD. The PCL-5 is a newer PTSD screening instrument which aligns with the most recent DSM-V (American Psychiatric Association, 2013) criteria for PTSD diagnosis. However, at the time of this project's conception, the PCL-5 only had one published validation study by the developers of the screening instrument. It was decided to utilize the PCL-C due to its being well-studied and validated. Although the PCL-C cannot be applied to the most recent DSM-V criteria for PTSD, it was determined that the DSM-IV-TR PTSD criteria would provide sufficient data for the purposes of this project.

The AUDIT tool (see Appendix C) has also been studied and used extensively as a valid and reliable screening tool for alcohol abuse and misuse (Berner, Kriston, Bentele, & Härter, 2007). There was not an available screening tool for access to lethal means which could be found in the literature. Therefore, a few short questions about access to firearms in the home and access to high-risk medications (e.g. opioids and psychiatric meds) were developed and received approval by the project chair and content expert. These questions were included in the demographics section of the survey (see Appendix D). The Depression and Anxiety Severity

Scale, or DASS-21, (see Appendix E) was added to the survey at the behest of the project chair. It was determined that the DASS-21 had good psychometric properties (Brown, Chorpita, Korotitsch, & Barlow, 1997) which may add insight for EMS agencies into the risk factors for EMS provider suicide.

An invitation-to-participate letter was sent out through the firefighter's union primary contact a week before the survey was sent out. The survey link with a consent form (see Appendix F) was emailed to the union's primary contact, which was then forwarded on to EMS providers through the union network. The survey was then distributed one week later through the State Bureau of EMS directly to each licensed EMS provider in the state. A third and final request for survey participation was sent out the following week through the EMS Bureau. At the conclusion of the third week of the survey period, a letter was sent out thanking participants and informing them of the closure of the survey.

A secure, web-based application called REDCap (Research Electronic Data Capture), designed to support data capture for research studies, was utilized as the host for the survey. At completion of the survey, the data were downloaded from REDCap to Microsoft Excel software for analysis. Descriptive statistics were used to evaluate each survey screening instrument. The instruments were scored as recommended (see Methods section). The data were then evaluated for clinical significance. A fact sheet (See Appendix G) was then developed to share the results of the survey with stakeholders and EMS providers.

### **Evaluation**

Objective one was accomplished by obtaining appointments and meeting with stakeholder in EMS. A meeting with administrators and union representatives for two separate departments lead to a meeting with the Professional Firefighters Union committee and president

of the union. This meeting included a presentation of the problem of suicide among EMS providers in general and the lack of data in Utah regarding risk factors for suicide. The committee accepted the project and offered to utilize their resources to disseminate the project.

A written plan for implementation was finalized with the stakeholders and submitted with the IRB application. Institutional Review Board approval of exempt status was received after making two revisions requested by the board (see Appendix H). One amendment to the IRB application was submitted and approved (see Appendix I). This amendment included two categories in the demographics of the survey: professional versus volunteer status and the number of EMS jobs the survey participant held. The second amendment to the IRB application requested an increase to the maximum number of participants and was approved (see Appendix J).

Objective two was accomplished through selection of risk factor screening tools, approval of the tools by all stakeholders through meetings and exchange of emails. Once the screening tools were approved, they were entered into REDCap - a secure, internet-based host ideal for use in electronic surveys. Once the survey was entered into REDCap, it was tested by ten people for functionality. No concerns were discovered.

The focus of objective 3 concerned implementation of the survey. Email lists for individual EMS providers were not available to the researcher due to confidentiality concerns by the EMS agencies. Distribution through the firefighter's union was chosen as the initial method for dissemination. However, the yield was low and the survey was then sent to the State Bureau of EMS. The latter method of distribution produced a significantly higher return. Data was gathered electronically in REDCap.

The data were downloaded to a secure computer and analyzed using Microsoft Excel software. Descriptive statistics were used to tabulate prevalence rates from the screening instruments. The data were also converted into table and graph form to be utilized in a poster presentation and slide presentations.

Dissemination of the survey results was the goal of objective four. A fact sheet (see Appendix G) with the results was emailed to the director of the Utah State Bureau of EMS and the president of the PFFU. The fact sheet was then sent to EMS providers through both of the agencies. The researcher has been invited to present the results of the survey to a PFFU conference in April, 2017. Additionally, the EMS Program Director for the State of Utah requested the researcher to present the results of the survey at a conference in September, 2017. Finally, a poster presentation was given to a committee from the College of Nursing. The presentation of the project and the poster (see Appendix K) was accepted by the committee.

### **Methods**

Demographic information was analyzed using descriptive statistics. Correlational relationships between demographic characteristics and screening results were beyond the scope of this project. Future recommendations for more in depth analysis of this information will be made.

The PCL-C tool was used in the survey to screen for PTSD. The tool is a 17-question screen which can be scored in two different ways. Questions one through five, six through 12, and 13 through 17 are grouped and labeled B-items, C-items, and D-items, respectively. These question groups align with the B, C, and D categories of the PTSD diagnostic criteria in the DSM-IV-TR manual (American Psychiatric Association, 2000). Each question is scored on a Likert scale of 1-5, with 5 being the most severe symptoms. The screen meets DSM criteria for

PTSD if the participant is symptomatic (score of 3 or more) in at least one B-items, three C-items, and two D-items. An alternative scoring option for the PCL-C is adding all scores together for a total severity score. A cut-off point for total severity score is determined by the population being screened. In the case of this project, a cut-off of 30 was used since the population is a civilian, non-military group.

The 10-question AUDIT tool was utilized to evaluate alcohol use among EMS providers. This tool utilizes a 5-point Likert-scale of 0-5, with the exception of questions 9 and 10 which have only 3-point scales which are scored 0, 2, or 4. A total score is calculated. According to the World Health Organization (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), hazardous drinking risk is stratified into four levels of risk: Zone I, Zone II, Zone III, and Zone IV. The zones increase in severity with Zone IV being the highest level of risk. Cut-off AUDIT total scores are 0-7 for Zone I, 8-15 for Zone II, 16-19 for Zone III, and 20+ for Zone 4. The cut-off points may be altered depending upon the population drinking patterns. Any scoring in questions 7-10 warrant further investigation into problem drinking.

The AUDIT tool also identifies different areas of drinking risk. Questions 1-3 relate to consumption problems, questions 4-6 relate to dependence problems, and questions 7-10 identify problems as a result of drinking. A total score greater than or equal to six in the consumption group indicates drinking risk. A total score of four or greater in the dependence group indicates hazardous drinking, and any score in the 7-10 question group suggests drinking-related harm.

Two questions related to access to lethal means of suicide were asked in the survey. One question asked about access to firearms and the other asked about access to high-risk medications. Simple descriptive statistics were used to determine access to lethal means of suicide.

## Results

A total of 1,343 EMS providers responded to the survey. Survey participants were given the option to answer or omit questions without penalty. Therefore, not all questions on the survey had the maximum number of respondents. Table 1 shows the demographic data collected. Of note, 68.7% of participants were male and 31.3% were female. The majority (66.7%) of participants were professional EMS providers while 33.3% were in volunteer positions. The vast majority of participants were White (94.3%) followed by Hispanic/Latino (2.8%), with the remaining ethnicities under 1% representation.

Since increased exposure to trauma is a risk factor for PTSD, the survey contained questions related to military service and additional EMS jobs. Over 23% of participants reported having additional EMS jobs outside of their primary employment. Of those, 63.4% had one additional job, 30.3% had two additional jobs, 5.2% had three additional jobs, and three (1%) participants reported having four or more additional EMS jobs. Eight percent of participants reported military service.

### Post-traumatic Stress Disorder

The PCL-C was scored using both the DSM-IV-TR criteria and a total severity score. The survey revealed that 25.5% of participants met DSM-IV-TR criteria for PTSD. This data aligns with the 20-32% prevalence rates of PTSD among EMS providers from the literature review.

However, when a total severity score was calculated, and a cut-off point of 30 was used, 55.6% of EMS providers had PTSD symptoms which warranted further clinical investigation. Higher cut-off points are used for high-risk PTSD groups such as military veterans. VA clinics may use a cut-off point of 45 for total severity score. Applying this cut-off point to the survey of

EMS personnel yields a 24.5% rate of PTSD symptoms. This finding is consistent with the rate found using the scoring method aligned with DSM-IV-TR criteria.

This data clearly demonstrated high rates of PTSD symptoms among EMS providers in Utah. The prevalence rates of PTSD in this survey were well-above national averages for the general population, and in some circumstances, higher than comparable populations. EMS providers in Utah are at greater risk for suicide based on the rates of PTSD found in this survey.

### **Alcohol Use and Access to Lethal Means**

The AUDIT screen revealed a 12.8% rate of problem drinking. Nine percent of participants scored in Zone II, 1.5% scored in Zone III, and 1.8% scored in Zone IV of the WHO criteria of alcohol consumption risk. Only 2.2% of participants had a dependence problem, but 13.3% had consumption problems while 21.2% indicated problems associated with drinking. Twenty-one percent of the participants scored in questions 7-10. According to the World Health Organization criteria, those who score any points in these questions should have further investigation into their drinking habits. When considering the rates of consumption problems (questions 1-3) and alcohol related problems (questions 7-10), EMS providers in Utah are demonstrating risky alcohol use patterns, which may lead to impulsivity and greater suicide risk.

Over 76% of participants indicated they had a firearm in their home. Another 76% stated they had access to firearms in other places such as a family member's or friend's home. By contrast, a recent Gallup poll (Gallup Inc, 2015) found that 39% of American households reported a firearm in the home, down from a peak of 51% in 1993. Nearly twice the numbers of EMS provider households have firearms as compared to the general population. This equates to easy access to lethal means of suicide.

Participants also indicated widespread access to lethal medications. Narcotics/opioids had the highest access rates at 59.6%. Sleep aids such as valium and Ativan were available to 51.9% of participants. Antidepressants (36.3%), selective serotonin reuptake inhibitors (36.3%), cardiovascular drugs (29.9%), and antipsychotics (8.1%) were also accessible to participants. Added to these lethal means are the myriad of suicide methods witnessed by EMS providers in the line of duty. Some of these methods include hanging, jumping from tall heights, and suffocation (e.g. intentional carbon monoxide poisoning). These data make it clear that Utah EMS providers have ample access to lethal means of suicide.

### **DASS-21**

While not a focus of this project, the DASS-21 was included to assess for mood problems among Utah EMS providers. Of concern, 29.1% of participants showed moderate to extremely severe depression. Twenty-one percent of participants indicated moderate to extremely severe anxiety, and 21% exhibited moderate to severe stress.

Statistical correlation of these data was not done as part of this project. Nevertheless, future analysis of this data may reveal correlations between mood symptoms and PTSD, alcohol use patterns, and suicidality. Correlating this data may help EMS agencies in accomplishing the goal of reducing suicide risk factors and focusing scarce resources on the most prevalent problems.

### **Recommendations for the Future**

This project has collected data regarding suicide risk factor from EMS providers. Foundational prevalence data can be utilized in many areas for the prevention of PTSD, alcohol misuse or abuse, and suicide as well as modifying access to lethal means of suicide. This data is specific to EMS providers in the State of Utah, which means generalization to providers outside



Utah may be limited. Therefore, a similar study in other states, or even nationwide, may be useful for widespread, unified efforts to combat EMS provider suicide.

This project can also be a stepping stone to investigate similar issues among law enforcement officers and other healthcare professionals (e.g. physicians, nurses, etc.). Suicide rates among law enforcement officers exceed those of firefighters and EMS providers (McIntosh et al., 2016). Prevalence data for suicide risk factors among this group also need to be investigated. The framework for investigation into risk factors has been established in this project which could be easily adapted for use among other high-risk cohorts.

Emergency medical services agencies should utilize this data in the procurement of funding and support for suicide prevention, intervention, and treatment programs. This data provides evidence of suicide risk factors prevalent among Utah EMS providers. Stakeholders can take this data to administrators, lawmakers, and public organizations to obtain the resources necessary in implementing prevention and treatment programs.

The Suicide Prevention Resources Center (SPRC) ( n.d.) recommends three key actions in workplace suicide prevention. First, employers should create a work environment which encourages good communication, connectedness, a sense of belonging, and respect. Second, employers must be able to identify and assist employees who are possibly at risk for suicide. Lastly, employers should have a plan in place to respond in the event of an employee suicide.

The Action Alliance for Suicide Prevention (AASP) (2017) has a “Workplace Task Force”. The main focus of this task force is “to deliver a compelling business case that offers solutions, provides support for employers, and motivates them from inaction to the implementation of a comprehensive, public health approach to suicide prevention, intervention, and postvention in the workplace.” These two resources, the SPRC and AASP, contain a full

array of prevention, intervention, and support resources for employers. Emergency medical services agencies can tap into these resources for further ideas, support, and motivation in implementing suicide prevention programs.

Finally, post-hoc analysis of this data could reveal correlational relationships between risk factors and demographics. Advanced statistical analysis could identify correlations between the suicide risk factors (PTSD, alcohol use, and access to lethal means) and demographic characteristics such as EMS job exposure, military experience, gender, age, and diagnosed psychiatric conditions. The DASS-21, which was included in this project, may also provide insight into the risk factors of suicide with further statistical analysis.

### **Doctorate of Nursing Practice Essentials**

This project addressed several Doctorate of Nursing Practice (DNP) Essentials as defined by the American Association of Colleges of Nursing (2006). The DNP Essentials are a set of indicators to guide doctoral nursing program excellence. By utilizing the essentials, this project not only enhanced student learning, but also contributed to the profession and society as well.

#### **DNP Essential I: Scientific Underpinnings for Practice**

This essential requires advanced practice nursing to be based upon a scientific foundation. Data from this project was successfully accumulated, analyzed, and reported using known scientific methods such as survey tools and statistical methods. The data can also be used by other scientific, academic, and medical disciplines for further research and development of suicide prevention programs, thus contributing to the overall body of scientific knowledge.

### **DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice**

Advanced practice nurses must be involved in the “discovery of new phenomena and the application of discoveries in increasingly complex practice situations” (American Association of Colleges of Nursing, 2006, p. 11). The suicide risk factors for Utah EMS providers have previously been poorly understood. This project attempted to discover the root problems behind EMS provider suicide. Through application of the Syndemic theory, the data from this project cast a light on the phenomenon of EMS provider suicide. Understanding these risk factors can enhance the nurse practitioner’s knowledge of the special circumstances of their patients who are EMS providers.

### **DNP Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes**

Interprofessional collaboration was the hallmark of this project. The project was accomplished only through cooperation between many professionals and their organizations. Firefighter-paramedics, emergency medical technicians, administrators, and scholars were all crucial parts of the project’s success. Through these collaborative efforts, critical suicide risk factor data was collected for dissemination to stakeholders in position to take action. Downstream sequela from the project can vastly improve the mental health and safety of those who protect and care for society.

### **DNP Essential VII**

This DNP essential aims to improve the nation’s health through clinical prevention and population health. Ultimately, this project aims to contribute to the reduction of mental health problems and suicidality among EMS providers in Utah. By collecting prevalence data on risk

factors among this cohort, proper and effective prevention programs can be developed. In due course, this data will find its way to those stakeholders in positions to acquire money and resources for successful EMS provider suicide prevention.

### **Conclusions**

Suicide continues to be a leading cause of death in the United States. Tragically, EMS providers are suffering a higher rate of suicide than the general population. Empirical evidence and expert opinion have suggested many causative factors for EMS provider suicide including PTSD, alcohol use, and access to lethal means. This project utilized an electronic survey distributed to all licensed EMS providers in the State of Utah to determine the prevalence rates of these risk factors.

The survey in this project was enthusiastically received by EMS providers throughout Utah which was demonstrated in the substantial response rate. As anticipated, EMS providers in Utah suffer significantly elevated rates of PTSD symptoms, risky alcohol use, and abundant access to lethal means of suicide when compared to the general population.

Ironically, during the implementation of this project, one Utah EMS provider took his own life. The data from this project will be important in identifying contributing risk factors for EMS provider suicide, procure funds and resources for prevention programs, and assist in the development of educational and screening guidelines for these providers.

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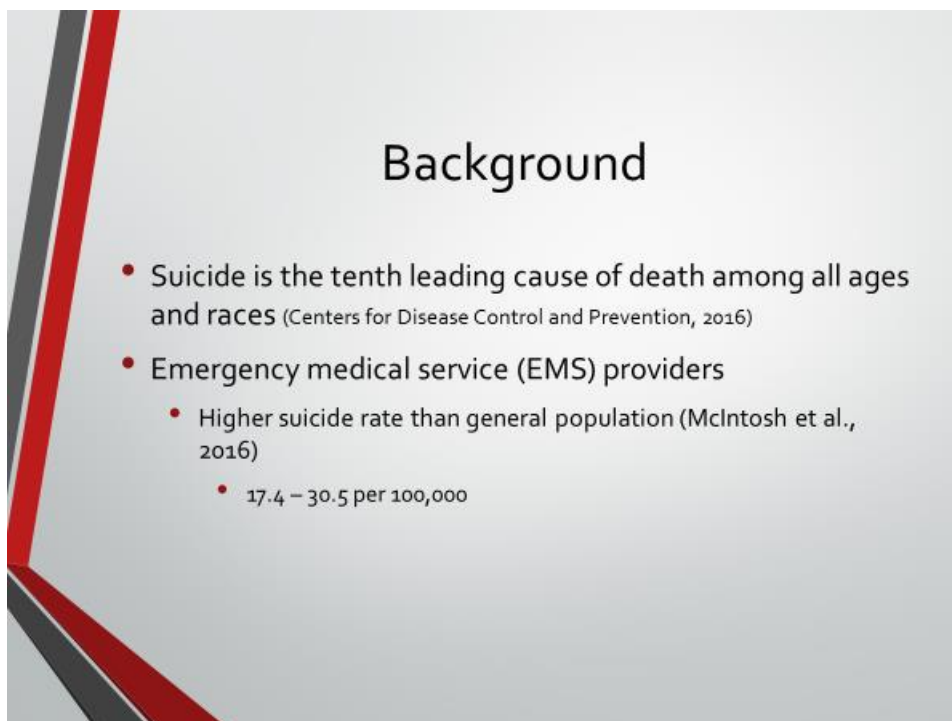
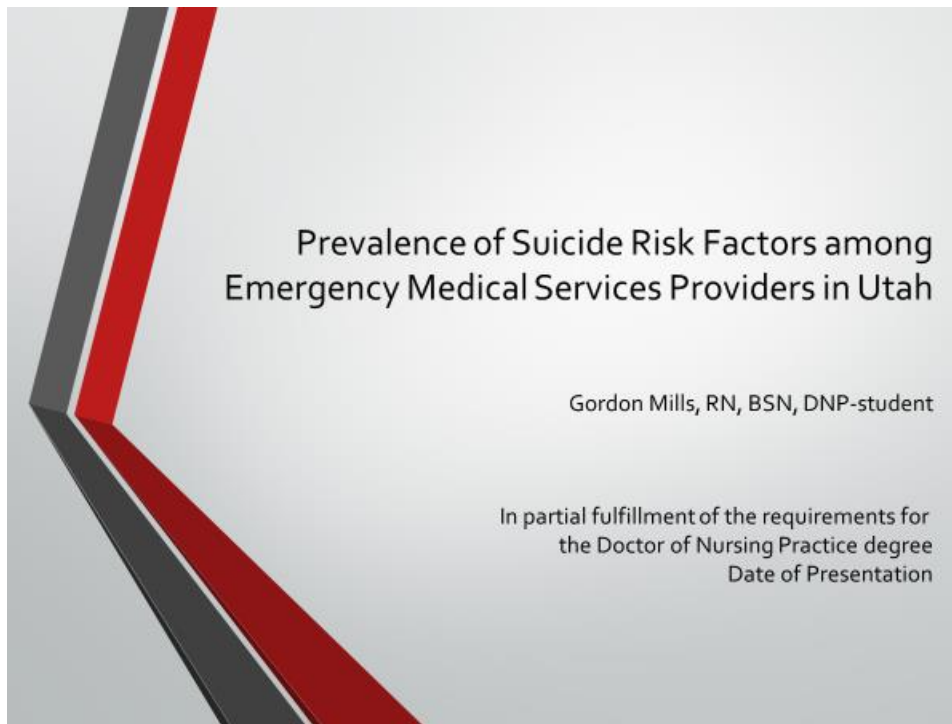
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## Appendix A



## Background

- EMS provider suicide risk factors:
  - Post-traumatic stress disorder (PTSD)
  - Alcohol use or misuse
  - Access to lethal means

## Problem Statement

- There is a lack of surveillance (prevalence) data regarding the severity of PTSD.
- Prevalence rates of alcohol use or misuse among EMS providers in Utah is also inadequate.
- EMS provider access to lethal means is also poorly understood.
- The purpose of this project is to collect suicide risk factor prevalence data to be used by EMS leaders who are in positions to take action.

## Significance & Policy Implications

- Reduce costs of suicide
  - Costs are estimated at \$58 billion annually (Shepard et al., 2016).
- Lack of suicide-related prevalence data for Utah EMS providers
  - Limits stakeholder ability to implement effective research, educational, identification, and treatment programs.
- Achieve national, regional, and local suicide prevention goals

## Significance & Policy Implications

- Suicide Prevention has been a focus of national, regional, and local health policy
  - National Strategy for Suicide Prevention (Office of the Surgeon General, & National Action Alliance for Suicide Prevention, 2012)
    - Goal 11 - Improved surveillance systems and timely reporting of suicide-related data.
  - Healthy People 2020 (US Department of Health and Human Services, 2016).
    - MHMD-1: Reduce the suicide rate by 10%

## Objectives

- Collaborate with EMS leaders to develop a survey plan
- Create a survey including access to lethal means questions and validated PTSD and alcohol screening tools
- Conduct a survey of EMS providers and analyze the data
- Disseminate findings to EMS leaders and the Emergency Medical Services Bureau for the State of Utah

## Theoretical Framework



- Syndemic Theory (Singer & Clair, 2003)
  - Poor outcomes caused by:
    - synergistic interaction of two or more disease factors, and
    - Social or cultural factors
  - Synergistic risk factors among EMS providers
    - PTSD
    - Alcohol use or misuse
    - Access to lethal means

## Literature Review

- PTSD in EMS
  - Critical incident stress contributes to PTSD (Halpern et al., 2012)
  - Chronic operational stress in combination with critical incident stress are significant predictors of PTSD in EMS providers (Donnelly, et al., 2016)
- PTSD associated with suicidality
  - General population
    - 6.4%
  - EMS providers and police officers
    - 20% - 30% (Javidi & Yadollahie, 2012; Skogstad et al., 2013)
- PTSD with co-morbid alcohol abuse
  - Statistically significant increase in suicide attempts versus PTSD or alcohol abuse alone (Arsenault-Lapierre, Kim, & Turecki, 2004; Blanco, et al., 2013; Maguen et al., 2015)

## Implementation & Evaluation

Objective #1	Implementation	Evaluation
Collaborate with stakeholders including EMS leaders, EMS union, EMS providers, and a content expert to develop a plan for collecting prevalence data from urban EMS providers in Utah.	<ol style="list-style-type: none"> <li>1. Obtain appointments to meet with key stakeholders in EMS services in Utah and content expert.</li> <li>2. Review current project plan for data collection and make amendments to the plan per recommendations by stakeholders.</li> <li>3. Finalize the plan for data collection and implementation.</li> <li>4. Apply for IRB approval for the study.</li> </ol>	<ol style="list-style-type: none"> <li>1. Appointments acquired for stakeholders.</li> <li>2. Stakeholder permission to implement project in their departments obtained.</li> <li>3. Finalized, written plan for data collection and implementation.</li> <li>4. IRB approval obtained.</li> </ol>

Objective #2	Implementation	Evaluation
Develop a survey for use in collecting prevalence data from EMS providers.	<ol style="list-style-type: none"> <li>1. Develop an electronic survey for collecting demographic data.</li> <li>2. Choose a validated PTSD screening tool for use in the survey.</li> <li>3. Choose a validated alcohol use/misuse screening tool for the survey.</li> </ol>	<ol style="list-style-type: none"> <li>1. Have a finalized, written survey including screening tools.</li> <li>2. Survey and screening tools approved by stakeholders and IRB</li> <li>3. Transfer written survey to RedCap for electronic use and distribution.</li> </ol>



## Implementation & Evaluation

Objective #3	Implementation	Evaluation
Conduct the survey of urban EMS providers and analyze the data.	<ol style="list-style-type: none"> <li>1. Obtain email lists from either the State Bureau of EMS or individual EMS agencies.</li> <li>2. Distribute the survey link via email to EMS providers.</li> <li>3. Re-submit survey request to any potential subjects who did not respond to initial survey after two weeks.</li> <li>4. Collect data from RedCap.</li> </ol>	<ol style="list-style-type: none"> <li>1. Email lists obtained.</li> <li>2. Survey distributed via email lists.</li> <li>3. Re-submission of survey after two weeks to non-respondents.</li> <li>4. Data collected and documented from RedCap survey, continuous until survey closes.</li> <li>5. Data analyzed and results recorded within two weeks of survey closure.</li> <li>6. Use descriptive statistics to determine prevalence of suicide risk factors.</li> </ol>
Objective #4	Implementation	Evaluation
Disseminate findings to EMS leaders and the Emergency Medical Services Bureau for the State of Utah.	<ol style="list-style-type: none"> <li>1. Email results to major stakeholders.</li> <li>2. Email results to at least two EMS agencies in Utah.</li> <li>3. Email results to content expert.</li> </ol>	<ol style="list-style-type: none"> <li>1. Results emailed to stakeholders within one month or project completion.</li> <li>2. EMS leaders and providers acknowledge receipt of project data.</li> </ol>

## Summary

- Collect prevalence data from Utah EMS providers regarding PTSD and alcohol use/misuse
- Analyze the data for trends and rates of suicide risk factors among Utah EMS providers
- Disseminate this surveillance data to individuals and organizations who can take action.

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  - Professor, University of Utah, College of Social Work
  - Dr. Landward works with the Salt Lake City Fire Department through suicide awareness and other mental health issue training among EMS providers. He has worked with military veterans, firefighters, police officers, and first responders.

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## Appendix B

## PTSD Check List – Civilian Version (PCL-C)

Below is a list of problems and complaints that individuals sometimes have in response to stressful life experiences. Please read each one carefully, put an “X” in the box to indicate how much you have been bothered by that problem in the last month.

No.	Response	Not at all	A little bit	Moderately	Quite a bit	Extremely
1	Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?	1	2	3	4	5
2	Repeated, disturbing dreams of a stressful experience from the past?	1	2	3	4	5
3	Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?	1	2	3	4	5
4	Feeling very upset when something reminded you of a stressful experience from the past?	1	2	3	4	5
5	Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?	1	2	3	4	5
6	Avoid thinking about or talking about a stressful experience from the past or avoid having feelings related to it?	1	2	3	4	5
7	Avoid activities or situations because they remind you of a stressful experience from the past?	1	2	3	4	5
8	Trouble remembering important parts of a stressful experience from the past?	1	2	3	4	5
9	Loss of interest in things that you used to enjoy?	1	2	3	4	5
10	Feeling distant or cut off from other people?	1	2	3	4	5
11	Feeling emotionally numb or being unable to have loving feelings for those close to you?	1	2	3	4	5
12	Feeling as if your future will somehow be cut short?	1	2	3	4	5
13	Trouble falling or staying	1	2	3	4	5

	asleep?					
14	Feeling irritable or having angry outbursts?	1	2	3	4	5
15	Having difficulty concentrating?	1	2	3	4	5
16	Being "super alert" or watchful on guard?	1	2	3	4	5
17	Feeling jumpy or easily startled?	1	2	3	4	5

## Appendix C

## Alcohol Use Disorders Identification Test (AUDIT)

Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential, so please be honest. For each question in the chart below, place an X in one box that best describes your answer.

NOTE: In the U.S., a single drink serving contains about 14 grams of ethanol or “pure” alcohol. Although the drinks below are different sizes, each one contains the same amount of pure alcohol and counts as a single drink:

12 oz. of beer (about 5% alcohol) = 8-9 oz. of malt liquor (about 7% alcohol) = 1.5 oz. of

hard liquor (about 40% alcohol)

No.	Questions	0	1	2	3	4	
1	How often do you have a drink containing alcohol?	Never	Monthly or less	2 to 4 times a month	2 to 3 times a week	4 or more times a week	
2	How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3	How often do you have 5 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4	How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5	How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7	How often during the last year have you had a feeling of guilt or remorse	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	

	after drinking?						
8	How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9	Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10	Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
Total							

## Appendix D

## Demographics and Access to Lethal Means Screening

1. What is your age group?
  - a. 18-24 years old
  - b. 25-34 years old
  - c. 35-44 years old
  - d. 45-54 years old
  - e. 55-64 years old
  - f. 65 years or older
2. What is your gender?
  - a. Male
  - b. Female
3. What is your ethnicity or race?
  - a. White
  - b. Hispanic or Latino
  - c. Black or African American
  - d. Native American or American Indian
  - e. Asian / Pacific Islander
  - f. Other
4. What is your current marital status?
  - a. Single, never married
  - b. Married or domestic partnership
  - c. Widowed
  - d. Divorced
  - e. Separated
5. What is the highest degree or level of school you have completed?
  - a. Less than high school diploma
  - b. High school diploma
  - c. College certificate
  - d. Associate's degree
  - e. Bachelor's degree
  - f. Master's degree
  - g. Doctorate degree
  - h. PhD
  - i. Other
6. What is your highest level of medical certification?
  - a. Emergency Medical Responder (EMR)
  - b. Emergency Medical Technician (EMT)
  - c. Advanced Emergency Medical Technician (A-EMT)
  - d. Basic Emergency Medical Technician (EMT-B)
  - e. Intermediate Emergency Medical Technician (EMT-I)



- f. Advanced Emergency Medical Technician (EMT-A)
  - g. Paramedic
  - h. None
7. How many years of Emergency Medical Services experience do you have?
- a. 0-4 years
  - b. 6-10 years
  - c. 11-15 years
  - d. 16-20 years
  - e. 21-25 years
  - f. 26-30 years
  - g. 31 or more years
8. At which emergency medical services department are you primarily employed? If not currently employed in emergency medical services, please enter "not employed in EMS".
- a. [Free text field]
9. Do you work for any additional EMS agencies?
- a. Yes
  - b. No
    - i. If yes, how many additional EMS jobs do you have?
      - 1. 1
      - 2. 2
      - 3. 3
      - 4. 4 or more
10. Please choose the option which best describes your EMS career:
- a. Professional/career
  - b. Volunteer
11. Do you now, or have you ever, served in the military?
- a. Yes
  - b. No
    - i. If yes, how many years did you serve in the military?
      - 1. 0-4 years
      - 2. 6-10 years
      - 3. 11-15 years
      - 4. 16-20 years
      - 5. 21-25 years
      - 6. 26 or more years
    - ii. In which branch or branches of the military have you served? Check all that apply.
      - 1. Army
      - 2. Navy
      - 3. Air Force
      - 4. Marine Corps
      - 5. Coast Guard
      - 6. Other

12. Is there a firearm in your home?
- a. Yes
  - b. No
    - i. If no, do you have access to a firearm, such as a family member's or friend's firearm?
      1. Yes
      2. No
13. Do you have access to the following medications/drugs? Check all that apply:
- a. Narcotics/Opioids (e.g. hydrocodone, oxycodone, hydromorphone, etc.)
  - b. Sleep aids (e.g. valium, Ativan, etc.)
  - c. Anti-depressants (e.g. amitriptyline, desipiramine, etc.)
  - d. SSRIs (e.g. Prozac or Zoloft. etc.)
  - e. Antipsychotics (e.g. risperidone, olanzapine, quetiapine, etc.)
  - f. Cardiovascular drugs (e.g. beta-blockers, calcium channel blockers, ace inhibitors, amiodarone, etc.)
14. Have you ever been diagnosed with a psychiatric disorder at some point in your life?
- a. No
  - b. Yes
    - i. If yes, check all that apply
      1. Major depressive disorder
      2. Major depressive disorder with suicidal thoughts
      3. Panic disorder
      4. Obsessive compulsive disorder
      5. Bipolar disorder
      6. Schizophrenia

## Appendix E

## Depression and Anxiety Scales (DASS) - 21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0-Did not apply to me at all - NEVER

1-Applied to me to some degree, or some of the time - SOMETIMES

2-Applied to me to a considerable degree, or a good part of time - OFTEN

3-Applied to me very much, or most of the time - ALMOST ALWAYS

I found it hard to wind down	0	1	2	3
I was aware of dryness of my mouth	0	1	2	3
I couldn't seem to experience any positive feeling at all	0	1	2	3
I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
I found it difficult to work up the initiative to do things	0	1	2	3
I tended to over-react to situations	0	1	2	3
I experienced trembling (e.g., in the hands)	0	1	2	3
I felt that I was using a lot of nervous energy	0	1	2	3
I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
I felt that I had nothing to look forward to	0	1	2	3
I found myself getting agitated	0	1	2	3
I found it difficult to relax	0	1	2	3
I felt down-hearted and blue	0	1	2	3
I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
I felt I was close to panic	0	1	2	3
I was unable to become enthusiastic about anything	0	1	2	3
I felt I wasn't worth much as a person	0	1	2	3

I felt that I was rather touchy	0	1	2	3
I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
I felt scared without any good reason	0	1	2	3
I felt that life was meaningless	0	1	2	3

## Appendix F

## Consent Cover Letter

*Prevalence of Suicide Risk-factors among Utah Emergency Medical Services Providers*

The purpose of this research project is to discover the extent of certain suicide risk factors among emergency medical services (EMS) providers in Utah. I am conducting this research because EMS providers experience higher rates of suicide than the general population. Understanding the risk factors associated with EMS provider suicide is one of the first steps in providing help for those at risk. Empirical data and limited research suggest certain risk factors are more common among EMS providers than the general population. The aim of this research project is to discover how common these risk factors are among EMS providers in Utah.

I would like to invite you to participate in an anonymous electronic survey. A survey link will be sent to you in a separate email. The survey should take no more than 15 minutes to complete. **Participation in this research project is voluntary.** You can choose not to take part. You can choose not to finish the questionnaire or omit any question you prefer not to answer without penalty. While participation in this survey has mild risks, your participation in the survey may increase any anxiety you may have.

This survey is designed to be anonymous. ***YOUR NAME/IDENTIFYING INFORMATION WILL NOT BE ASSOCIATED IN ANY WAY WITH THIS SURVEY. ALL INFORMATION IS ANONYMOUS AND CANNOT BE TRACKED TO YOU.*** In addition, all data received from this survey will be stored on encrypted, secure servers and drives.

If you have any questions, complaints or if you feel you have been harmed by this research please contact Gordon Mills, RN, BSN, University of Utah, College of Nursing at (801) 581-3414. If you have personal concerns and need treatment for the risk factors addressed in the survey, contact your employee assistance program where available, a personal provider, or your EMS department authorities.

If you or someone you know is experiencing work-related stress or suicidal thoughts, there are many resources which may help. The University Neuropsychiatric Institute (UNI) has a crisis line which is available 24/7 at 801-587-3000. The National Suicide Prevention Hotline is similarly staffed around the clock at 1-800-273-8255. Additionally, a useful smart phone app called SafeUT can be downloaded in the iTunes or Google Play stores, or at [www.healthcare.utah.edu/uni/clinical-services/safe-ut/](http://www.healthcare.utah.edu/uni/clinical-services/safe-ut/).

Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at [irb@hsc.utah.edu](mailto:irb@hsc.utah.edu).

By returning this questionnaire, you are giving your consent to participate.

Thank you for taking time to participate in this research project. I will truly value the information you provide. Your responses are vital in helping EMS leaders and policy makers provide education, intervention, and prevention strategies for yourself and other EMS providers.

Sincerely,  
Gordon Mills, RN, BSN, SNP-student  
University of Utah, College of Nursing

## Appendix G

## Prevalence of Suicide Risk-factors among Utah Emergency Medical Services Providers Survey

March 25, 2017

Dear Utah EMS provider,

Over the last several weeks, you have probably seen requests to participate in a survey regarding suicide risk factors among Utah EMS providers. The survey closed on March 4, 2017. Although the subject matter of this survey was sensitive and difficult to address, you came together as a group to provide excellent data which can be utilized to address the problem of suicide among EMS providers. Over 1,300 people participated in the survey. The purpose of the survey was to collect prevalence data (e.g. how many people have the problem at a given point in time) on post-traumatic stress disorder (PTSD), alcohol abuse, and access to lethal means of suicide.

As a fellow EMS provider, I took on this project with a sincere desire to help my brothers and sisters in the EMS community battle this affliction. I plan to continue addressing this issue with stakeholders to improve the mental health of our EMS providers and to prevent any further loss of life due to suicide.

In an effort to keep all EMS providers informed, I am including the data from this survey in this letter. I will provide a short discussion of the results and future recommendations. Lastly, if you or anyone you know are struggling with mental health issue or have suicidal thoughts, please seek help. The University Neuropsychiatric Institute (UNI) has a crisis line which is available 24/7 at 801-587-3000. The National Suicide Prevention Hotline is similarly staffed around the clock at 1-800-273-8255. Additionally, a useful smart phone app called SafeUT can

be downloaded in the iTunes or Google Play stores, or at [www.healthcare.utah.edu/uni/clinical-services/safe-ut/](http://www.healthcare.utah.edu/uni/clinical-services/safe-ut/).

### **Post-traumatic stress disorder (PTSD)**

It has long been understood that EMS personnel *likely* suffer from PTSD as a result of daily exposure to human suffering and tragedy. However, the few studies that exist to determine how many EMS providers may have PTSD are usually done on local levels or individual departments. This survey encompassed EMS providers from all corners of Utah. The rate of PTSD among the general population is about 6% (Pietrzak, Goldstein, Southwick, & Grant, 2011b). However, this survey showed that 55% of EMS personnel who responded had PTSD symptoms which justify further investigation, including 26% of respondents who had diagnosable PTSD. (See below for graphs).

### **Alcohol Abuse and Risky Alcohol Use**

Alcohol abuse leads to impulsive behaviors. About 6% of the general population have alcohol dependency or risky alcohol use (Hedden et al., 2015). According to this survey, 12.8% of respondents had alcohol dependence or risky use. Both the PTSD and alcohol abuse screening tools were validated instruments which accurately screen for these problems when answered honestly.

### **Access to Lethal Means**

A poll of American households in 2015 found that 39% of homes had firearms (Gallup Inc, 2015). Data about access to high-risk medications was not found in the literature, the millions of prescriptions per year are written for these medications. It is safe to assume that a majority of homes in the United States will contain risky medications. Of the EMS providers

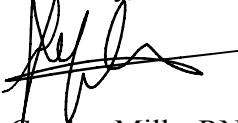
surveyed, 76% stated they had firearms in the home and over 59% had access to high-risk medications.

### **Future Recommendations**

One in ten EMS providers who responded to the survey had all three risk factors. This is alarming since the combination of these risk factors can place the individual at higher-risk for suicide. The high rates of these three risk factors help to justify increased funding and support for suicide prevention and treatment programs. This data can be used to approach lawmakers, administrators, and other stakeholders in addressing some of the risk factors associated with EMS provider suicide. In addition, peer support groups at local EMS agencies should also be created and implemented as a way to monitor for mental health concerns, provide a stress release forum, and monitor for suicidal ideations.

Once again, thank you so much for participating in this endeavor. The EMS community in Utah is a tight-knit group of caring professionals who look out for the public health and for each other. The concern you have for your fellow-providers was evident in the extraordinary response to this survey.

Sincerely,



Gordon Mills, RN, BSM, DNP-FNP student

University of Utah, College of Nursing



## References

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<http://www.gallup.com/poll/1645/Guns.aspx>

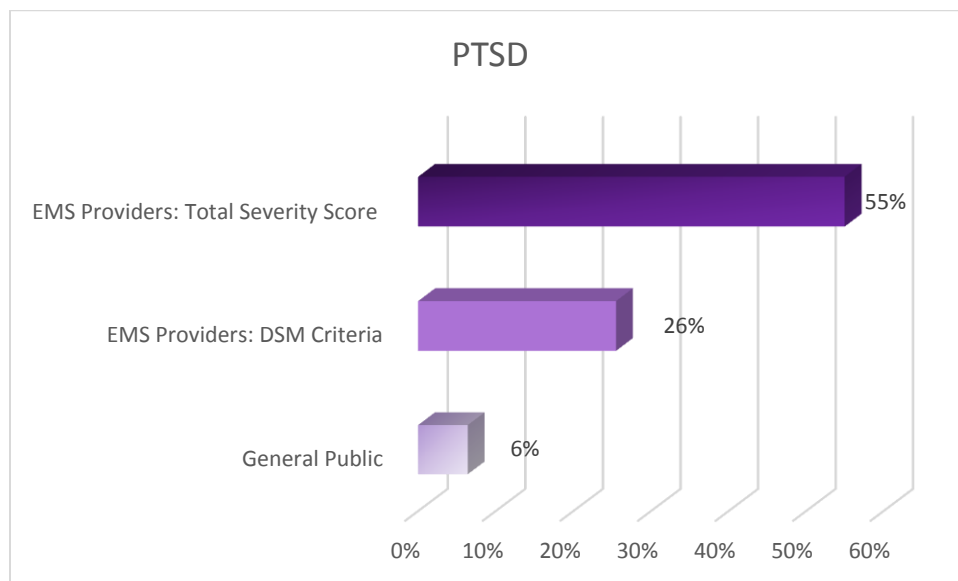
Hedden, S. L., Kennet, J., Lipari, R., Medley, G., & Tice, P. (2015). Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health.

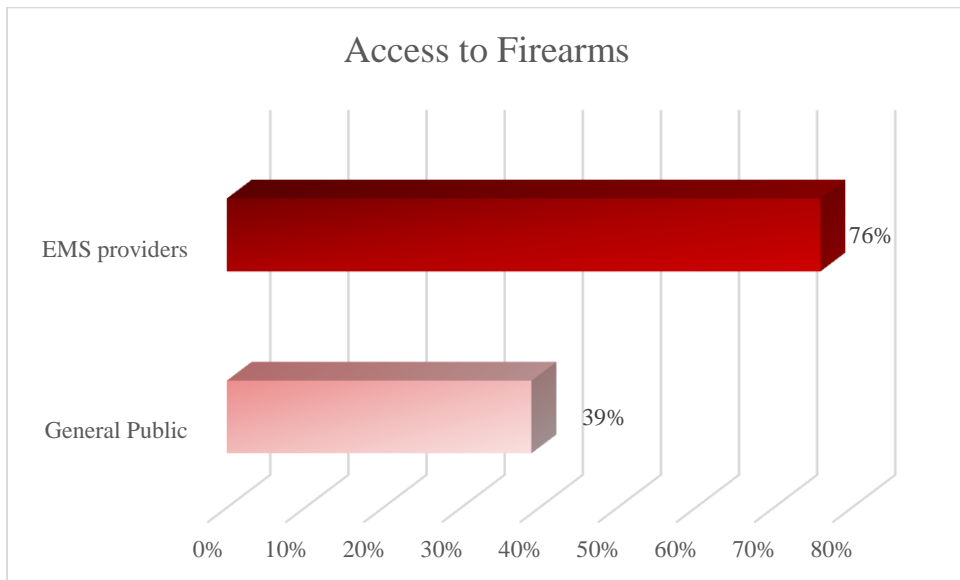
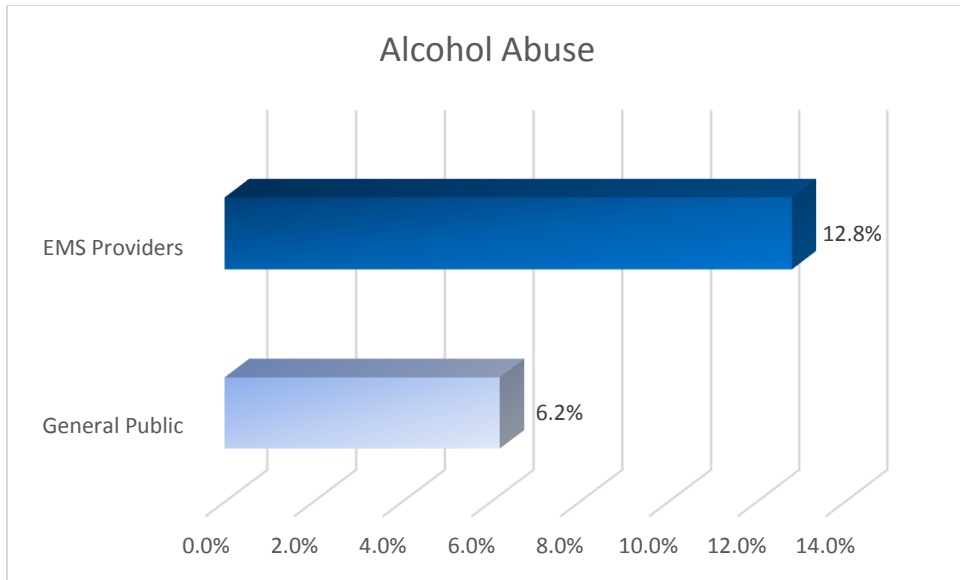
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Pietrzak, R. H., Goldstein, R. B., Southwick, S. M., & Grant, B. F. (2011). Prevalence and Axis I comorbidity of full and partial posttraumatic stress disorder in the United States: results from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions.

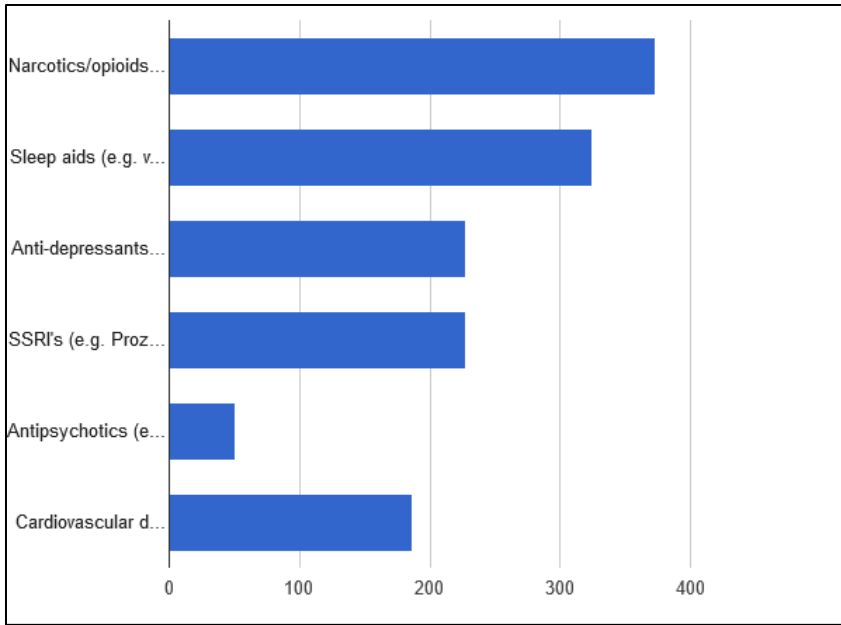
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<https://doi.org/10.1016/j.janxdis.2010.11.010>





### Access to High-Risk Medications



## Appendix H

## Institutional Review Board Approval

ERICA IRB New Study Approval

<https://www.umail.utah.edu/owa/?ae=Item&tr=IPM.Note&id=RgAAAAAD...>**ERICA IRB New Study Approval**

Institutional Review Board

Sent: Tuesday, December 27, 2016 11:27 AM

To: GORDON DALE MILLS

Cc: Michael Johnson

**INSTITUTIONAL REVIEW BOARD**

THE UNIVERSITY OF UTAH

75 South 2000 East Salt Lake City, UT 84112 | 801.581.3655 | IRB@utah.edu

**IRB:** [IRB\\_00096994](#)**PI:** Gordon Mills**Title:** Prevalence of Suicide Risk-factors among Utah Emergency Medical Services Providers**Date:** 12/27/2016

The above-referenced protocol has received an IRB exemption determination and may begin the research procedures outlined in the University of Utah IRB application and supporting documents.

**EXEMPTION DOCUMENTATION****Review Type:** Exemption Review**Exemption Category(ies):** Category 2**Exemption Date:** 12/27/2016

Note the following delineation of categories:

- Categories 1-6: Federal Exemption Categories defined in 45 CFR 46.101(b)
- Categories 7-11: Non-Federal Exemption Categories defined in University of Utah IRB policy in [Investigator Guidance Series, Exempt Research](#)

You must adhere to all requirements for exemption described in University of Utah IRB policy in ([Investigator Guidance Series, Exempt Research](#)). This includes:

- All research involving human subjects must be approved or determined exempt by the IRB before the research is conducted.
- All research activities must be conducted in accordance with the Belmont Report and must adhere to principles of sound research design and ethics.
- Orderly accounting and monitoring of research activities must occur.

**Ongoing Submissions for Exempt Projects**

- **Continuing Review:** Since this determination is not an approval, the study does not expire or need continuing review. This determination of exemption from continuing IRB review only applies to the research study as submitted to the IRB. You must follow the protocol as proposed in this application
- **Amendment Applications:** Substantive changes to this project require an amendment application to the IRB to secure either approval or a determination of exemption. **Investigators should contact the IRB Office if there are questions about whether an amendment consists of substantive changes.** Substantive changes include, but are not limited to
  - Changes to study personnel (to secure Conflict of Interest review for all personnel on the study)
  - Changes that increase the risk to participants or change the risk:benefit ratio of the study
  - Changes that affect a participant's willingness to participate in the study
  - Changes to study procedures or study components that are not covered by the Exemption Category determined for this study (listed above)
  - Changes to the study sponsor

## Appendix I

## Institutional Review Board Amendment Approval

ERICA IRB Notification: Amendment Outcome

<https://www.ualmail.utah.edu/owa/?ae=Item&t=IPM.Note&id=RgAAAAD...>**ERICA IRB Notification: Amendment Outcome**

Institutional Review Board

Sent: Friday, January 13, 2017 12:47 PM

To: GORDON DALE MILLS

Cc: Michael Johnson

**INSTITUTIONAL REVIEW BOARD**

THE UNIVERSITY OF UTAH

75 South 2000 East Salt Lake City, UT 84112 | 801.581.3655 | IRB@utah.edu

**IRB:** [IRB\\_00096994](#)**PI:** [Gordon Mills](#)**Title:** Prevalence of Suicide Risk-factors among Utah Emergency Medical Services Providers**Date:** 1/13/2017

This Amendment Application (Recruitment process) qualifies for an expedited review by a designated University of Utah IRB member according to University IRB policy. The designated IRB member has reviewed and approved your amendment request for this study on 1/13/2017. The approval of the amendment is effective as of 1/13/2017.

The approval of this amendment request does NOT change the exemption status of this study under **Exemption Category 2**. Note the following delineation of categories:

- Categories 1-6: Federal Exemption Categories defined in 45 CFR 46.101(b)
- Categories 7-11: Non-Federal Exemption Categories defined in University of Utah IRB policy at [http://irb.utah.edu/\\_pdf/IGS-ExemptResearch.pdf](http://irb.utah.edu/_pdf/IGS-ExemptResearch.pdf)

You must adhere to all requirements for exemption described in University of Utah IRB policy ([http://irb.utah.edu/\\_pdf/IGS-ExemptResearch.pdf](http://irb.utah.edu/_pdf/IGS-ExemptResearch.pdf)). This includes:

- All research involving human subjects must be approved or determined exempt by the IRB before the research is conducted.
- All research activities must be conducted in accordance with the Belmont Report and must adhere to principles of sound research design and ethics.
- Orderly accounting and monitoring of research activities must occur.

**Ongoing Submissions for Exempt Projects**

- **Continuing Review:** Since an exemption determination is not an approval, the study does not expire or need continuing review. This determination of exemption from continuing IRB review only applies to the research study as submitted to the IRB. You must follow the protocol as proposed in the application.
- **Amendment Applications:** Substantive changes to this project require an amendment application to the IRB to secure either approval or a determination of exemption. **Investigators should contact the IRB Office if there are questions about whether an amendment consists of substantive changes.** Substantive changes include, but are not limited to:
  - Changes to study personnel (to secure Conflict of Interest review for all personnel on the study)
  - Changes that increase the risk to participants or change the risk:benefit ratio of the study
  - Changes that affect a participant's willingness to participate in the study
  - Changes to study procedures or study components that are not covered by the Exemption Category determined for this study (listed above)

## Appendix J

## Institutional Review Board Amendment Approval

ERICA IRB Notification: Amendment Outcome

<https://www.umail.utah.edu/owa/?ae=Item&tr=IPM.Note&id=RgAAAAAD...>**ERICA IRB Notification: Amendment Outcome**

Institutional Review Board

Sent: Wednesday, March 01, 2017 4:27 PM

To: GORDON DALE MILLS

Cc: Michael Johnson



75 South 2000 East Salt Lake City, UT 84112 | 801.581.3655 | IRB@utah.edu

**IRB:** [IRB\\_00096994](#)**PI:** [Gordon Mills](#)**Title:** Prevalence of Suicide Risk-factors among Utah Emergency Medical Services Providers**Date:** 3/1/2017

This Amendment Application (Enrollment) qualifies for an expedited review by a designated University of Utah IRB member according to University IRB policy. The designated IRB member has reviewed and approved your amendment request for this study on 3/1/2017. The approval of the amendment is effective as of 3/1/2017.

The approval of this amendment request does NOT change the exemption status of this study under **Exemption Category 2**. Note the following delineation of categories:

- Categories 1-6: Federal Exemption Categories defined in 45 CFR 46.101(b)
- Categories 7-11: Non-Federal Exemption Categories defined in University of Utah IRB policy at [http://irb.utah.edu/\\_pdf/IGS-ExemptResearch.pdf](http://irb.utah.edu/_pdf/IGS-ExemptResearch.pdf)

You must adhere to all requirements for exemption described in University of Utah IRB policy ([http://irb.utah.edu/\\_pdf/IGS-ExemptResearch.pdf](http://irb.utah.edu/_pdf/IGS-ExemptResearch.pdf)). This includes:

- All research involving human subjects must be approved or determined exempt by the IRB before the research is conducted.
- All research activities must be conducted in accordance with the Belmont Report and must adhere to principles of sound research design and ethics.
- Orderly accounting and monitoring of research activities must occur.

**Ongoing Submissions for Exempt Projects**

- **Continuing Review:** Since an exemption determination is not an approval, the study does not expire or need continuing review. This determination of exemption from continuing IRB review only applies to the research study as submitted to the IRB. You must follow the protocol as proposed in the application.
- **Amendment Applications:** Substantive changes to this project require an amendment application to the IRB to secure either approval or a determination of exemption. **Investigators should contact the IRB Office if there are questions about whether an amendment consists of substantive changes.** Substantive changes include, but are not limited to:
  - Changes to study personnel (to secure Conflict of Interest review for all personnel on the study)
  - Changes that increase the risk to participants or change the risk:benefit ratio of the study
  - Changes that affect a participant's willingness to participate in the study
  - Changes to study procedures or study components that are not covered by the Exemption Category determined for this study (listed above)

Appendix K



Gordon Mills, RN, BSN, DNP-FNP student, University of Utah, College of Nursing

<p><b>Key Point:</b> Utah EMS providers are at increased risk for suicide. Understanding the risk factors leading to suicide aids in development of prevention and treatment programs.</p>	<p><b>Methods</b></p>	<p><b>Discussion</b></p>
<p><b>Purpose</b></p>	<ul style="list-style-type: none"> <li>Survey distribution and data collection via REDCap</li> <li>Three validated screening tools:                             <ul style="list-style-type: none"> <li>PTSD Check List – Civilian (PCL-C)</li> <li>Alcohol Use Disorders Identification Test (AUDIT)</li> <li>Depression and Anxiety Severity Scale (DASS-21)</li> </ul> </li> <li>Questions regarding access to firearms and high-risk medications included.</li> <li>Survey distributed by email through the Professional Firefighters Union and the Utah State Bureau of EMS.</li> </ul>	<ul style="list-style-type: none"> <li>Utah EMS providers clearly exceed general population rates for PTSD                             <ul style="list-style-type: none"> <li>More than half have symptoms of PTSD</li> <li>One-fourth meet DSM-IV criteria for PTSD diagnosis</li> </ul> </li> <li>Alcohol abuse is 2x the rate of the general population</li> <li>The majority of Utah EMS providers have access to lethal means of suicide</li> <li>126 of the 1,343 EMS providers surveyed had all three risk factors</li> </ul>
<p>The objective of this project was to discover the prevalence rates of three suicide risk factors among Utah EMS providers:</p> <ul style="list-style-type: none"> <li>Post-traumatic Stress Disorder (PTSD)</li> <li>Alcohol abuse</li> <li>Access to lethal means</li> </ul>	<p><b>Results</b></p>	<p><b>Conclusions</b></p>
<p><b>Background</b></p>	<p>N=1,343</p>	<p>Determined suicide risk factors among Utah EMS providers is significantly higher than general population</p> <ul style="list-style-type: none"> <li>Alarming high rates provides agencies with justification to obtain additional support and funding.</li> </ul> <p><b>Limitations:</b> Self-reported surveys</p> <ul style="list-style-type: none"> <li>Selection bias - voluntary participation</li> <li>Response bias - Some participants may be afraid to accurately report for fear of losing employment</li> </ul> <p><b>Recommendations:</b></p> <ul style="list-style-type: none"> <li>Utilize data to implement statewide programs for PTSD, substance abuse, and suicide prevention and treatment programs.</li> <li>Develop and implement employee awareness training and peer support groups in local departments.</li> </ul>
<ul style="list-style-type: none"> <li>Suicide rate among general U.S. population is 13 per 100,000</li> <li>Suicide rate for EMS providers is 17.2 to 30.5 per 100,000, or up to 2.4X the general population.</li> <li>PTSD in the general population is 6.4%.</li> <li>Alcohol abuse in the general population is 6.2%.</li> <li>A 2015 national survey found that 39% of U.S. households had a firearm.</li> <li>Syndemic theory suggests a synergistic relationship between the three risk factors which increase suicide risk in EMS providers.</li> <li>Data on PTSD, alcohol abuse, and access to lethal means <b>has not been studied</b> for Utah EMS providers</li> </ul>		



Table 1

<b>Age groups (in years)</b>	n=1,239
18-24	186 (15.0%)
25-34	296 (23.9%)
35-44	362 (29.2%)
45-54	233 (18.8%)
55-64	138 (11.1%)
65+	24 (1.9%)
<b>Gender</b>	n=1,237
Male	850 (68.7%)
Female	387 (31.3%)
<b>Ethnicity/race</b>	n=1,233
White	1,163 (94.3%)
Hispanic/Latino	34 (2.8%)
Black/African American	2 (0.2%)
Native American/American Indian	8 (0.6%)
Asian	5 (0.4%)
Pacific Islander	6 (0.5%)
Other	15 (1.2%)
<b>Marital Status</b>	n=1,238
Single, Never Married	241 (19.5%)
Married/domestic partnership	881 (71.2%)
Widowed	6 (0.5%)
Divorced	97 (7.8%)
Separated	13 (1.1%)
<b>Education</b>	n=1,238
Less than High School	12 (1.0%)
High School Diploma	299 (24.2%)
College certificate	248 (20.0%)
Associate's Degree	290 (23.4%)
Bachelor's Degree	303 (24.5%)
Master's Degree	62 (5.0%)
Doctorate Degree	4 (0.3%)
PhD	2 (0.2%)
Other	18 (1.5%)



Table 1 continued

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Table 1 continued

<b>Medical Certification</b>	n=1,234
Emergency Medical Responder (EMR)	29 (2.4%)
Emergency Medical Technician (EMT)	133 (10.8%)
Basic Emergency Medical Technician (EMT-B)	184 (14.9%)
Intermediate Emergency Medical Technician (EMT-I)	37 (3.0%)
Advanced Emergency Medical Technician (EMT-Paramedic)	383 (31.0%)
Nurse	368 (29.8%)
Nurse Practitioner	35 (2.8%)
Physician Assistant	1 (0.1%)
Physician	2 (0.2%)
Other	1 (0.1%)
	61 (4.9%)
<b>EMS Experience, in years</b>	n=1,237
0-4	375 (30.3%)
6-10	266 (21.5%)
11-15	183 (14.8%)
16-20	166 (13.4%)
21-25	116 (9.4%)
26-30	67 (5.4%)
31+	64 (5.2%)
<b>Additional EMS jobs outside primary employment</b>	n=1,208
Yes	288 (23.8%)
No	920 (76.2%)
<b>Number of Additional EMS jobs (for those who responded 'yes')</b>	n=287
1	182 (63.4%)
2	87 (30.3%)
3	15 (5.2%)
4+	3 (1.0%)

Table 1 continued

<b>EMS Career status</b>	n=1,209
Professional	806 (66.7%)
Volunteer	403 (33.3%)
<b>Military Service</b>	n=1,232
Yes	108 (8.8%)
No	1,124 (91.2%)
<b>Years of Military Service (in years)</b>	n=108
0-4	43 (39.8%)
6-10	38 (35.2%)
11-15	9 (8.3%)
16-20	4 (3.7%)
21-25	10 (9.3%)
26+	4 (3.7%)
<b>Military branches served</b>	n=107
Army	57 (53.3%)
Navy	21 (19.6%)
Air Force	22 (20.6%)
Marine Corps	16 (15.0%)
Coast Guard	1 (0.9%)
Other	3 (2.8%)

**Figure 1**

Syndemic Theory applied to EMS provider suicide risk factors

