OPINIONS ON SUICIDE AND PERCEIVED BARRIERS TO CARE IN A SAMPLE OF UNITED STATES MARINE NON-COMMISSIONED OFFICERS: IMPLICATIONS FOR FUTURE FRONTLINE SUPERVISORS' SUICIDE PREVENTION TRAINING PROGRAMS

by

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ABSTRACT

Opinions on Suicide and Perceived Barriers to Care in a Sample of United States Marine Non-Commissioned Officers: Implications for Future Frontline Supervisors' Suicide Prevention Training Programs

Marcus VanSickle, Masters of Science, 2013

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Background: Suicide remains a significant public health problem within the Department of Defense and within the United States Marine Corps (USMC). To date, there is limited scientific evidence for the efficacy of current suicide prevention programs, which appear to focus on a one-size-fits-all approach. What remains unknown is whether culturally appropriate suicide training programs need to be tailored to the unique needs of specific subgroups within the military. Purpose: The broad objectives of the study were threefold: (1) to gain a better understanding of the most frequently observed stressors in distressed Marines and the most frequently used resources for risk mitigation; (2) to generate lessons learned for the best adaptation of suicide prevention training programs in the USMC to the unique needs of Non-Commissioned Officers (NCOs) based on their demographics, suicide exposure, opinions about suicide, and perceived barriers to care; and (3) to compare Air, Ground, and Logistics Marines on

opinions about suicide and perceived barriers to care. Methods: Baseline data (i.e., pre-training) from a convenience sample of 1758 Marine NCOs, collected as part of an evaluation study on the Never Leave a Marine Behind suicide prevention program (2009-2010) was used for the analyses in this cross-sectional study. Results: The most frequently encountered distress-related issues were relationships, work problems, finances, and alcohol-related. Mental health resources appear to be under-utilized; an overreliance on the chain of command as a referral source is evident. Females NCOs and those with higher education showed a greater knowledge of but less accepting opinions of suicide. Those with prior exposure to suicide within their military unit were significantly more likely to view suicide as a result of emotional perturbation. Contrary to expectations, Marine NCOs with higher education and prior exposure to suicide were more likely to perceive general barriers to care. Finally, several between group differences on perceived barriers to care were noted among Marines representing the Air, Ground, and Logistics divisions. Discussion: Suicide prevention training programs must be more closely tailored to the unique needs of specific subgroups within the military environment – with particular attention paid to trainee factors such as sex, education, exposure to suicide within one's military unit, and membership in Air, Logistics, or Ground communities.

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CHAPTER 1: Introduction

PUBLIC HEALTH SIGNIFICANCE OF SUICIDE IN THE UNITED STATES MILITARY

Within the Department of Defense (DoD), suicide presents a serious threat to mission readiness and unit morale. While the number of military suicides remains comparable to that of the civilian population when controlling for demographic variables (35) suicide remains the second leading cause of death for military service members (28) with a majority of cases between the pay grades of E-1 and E-4 (28). Additionally, characteristics of the majority of service members who died by suicide included being Caucasian, under the age of 25, single and/or divorced; firearms were reported as the most commonly used method (28). In 2011 alone, 301 suicide deaths occurred within the DoD (28). While suicide deaths are tracked systematically within the DoD Suicide Event Report (DoDSER), surveillance efforts on suicide attempts are currently in their infancy and likely underestimate the true rate of attempted suicide within the DoD. The Centers for Disease Control and Prevention (9) reports an approximate 25 to 1 ratio of attempts to suicides for adults over 18 years of age. This estimation suggests approximately 7,525 service members attempted suicide in 2011, which is far greater than indicated in the most current DoDSER.

SUICIDE PREVENTION IN THE UNITED STATES MILITARY

Significant efforts to reduce suicide DoD-wide began in 1999 with the launch of the Suicide Prevention and Risk Reduction Committee (SPARRC) intended to increase collaboration among services with the goal of reducing suicides (12). Prior to its establishment, each service maintained its own separate prevention program (e.g., the

Marine Corps Suicide Prevention Program [MCSPP]) and suicide tracking systems (e.g., Department of the Navy Suicide Incident Report [DoNSIR]) allowing for minimal communication among the branches. The SPARRC led the way for several working groups on suicide prevention and the eventual creation of a standardized, DoD-wide suicide reporting system in 2008, the DoDSER, which currently allows for tracking and comparison of suicides across the armed services (12).

While communication between services has increased following the creation of SPARRC and each branch of service continues to use the DoDSER for reporting suicides, the significant population, cultural, mission, and leadership differences between the services highlight the need for service-driven and culturally-sensitive suicide prevention programs. Each branch of service (Army, Navy, Air Force, and Marine Corps) varies drastically on its total size as well as percentages of enlisted to officer, male to female, ethnic composition, age, and marital status (2) many of which are factors related to suicide and suicide prevention. Significant differences have also been identified between the services on risk for suicide as well attempted suicides per year (12). Given that the current study focuses primarily on the United States Marine Corps (USMC) suicide prevention program, the following sections provide an overview of the problem of suicide within the USMC and the prevention efforts underway within this branch of service.

SUICIDE RISK IN THE UNITED STATES MARINE CORPS

The USMC is composed of approximately 195,000 active-duty service members (18). In comparison to other branches, Marines are younger (62% are 25 or younger), higher percentage enlisted (1 to 7.8 officer to enlisted ratio, next highest is Navy-1 to

4.9), primarily male (92.95%, next highest is Army 86.51%), and least married (48.9% married, next highest is Navy 53.4%), all of which factor into the USMC being at the highest risk for suicide among the services (35). However, despite these high-risk factors, historically the USMC suicide rates were significantly lower than predictions based on demographics and comparison to population statistics following the development of the MCSPP through 2008 (35). More recently, a sharp increase in USMC suicides occurred in 2009 (28) nearly doubling suicides reported in previous years. These numbers decreased significantly in 2010 and 2011; however a surge of suicides in 2012 (40) indicate that the number of incidents are increasing and suggest the need to revisit current prevention measures.

Specific factors have been identified within the USMC to be correlated with suicides. All 32 suicides in 2011 were completed by males, 93% were enlisted, 96% were Caucasian, and 65% were between the pay grades E1-E4 (28). Additionally, 90 percent of suicides were Marines without additional education beyond a high school diploma, and only 37.5% were married (28). Infantry (combat arms) Marines were most likely to die by suicide (42); however deployment history was not a significant predictor of suicide.

SUICIDE PREVENTION IN THE UNITED STATES MARINE CORPS

Official USMC suicide prevention efforts began in 1997, following the suicide of former Chief of Naval Operations Admiral Boorda, with the instituting of a mandatory 1-hour training on suicide prevention for all Marines (42). Preliminary evaluation of this training showed great promise as evidenced by a 26% decrease in suicides from the previous 9 years in the 9 years following training implementation (42). Since its

inception, and in addition to several initiatives DoD-wide, the MCSPP has initiated several new suicide prevention efforts within the USMC. The USMC has made initial training on suicide prevention mandatory at all initial entry sites to include recruit training, officer candidate school, and the basic school, ensuring that all Marines receive a basic level of training on suicide (21).

Additionally, the USMC has included small-group discussions on suicide in its required training through the Marine Corps Martial Arts Program (MCMAP). These discussions are led by a trained instructor and are intended to produce active engagement among participants. The USMC has also trained "gatekeepers" to recognize, assist, and refer Marines who may be at risk for suicide to appropriate sources for care (e.g., mental health professionals and chaplains). Senior leadership has also been encouraged to play an active role in suicide prevention and have since released videos to all Marines in which they discuss suicide and its impact on the organization (21). These programs include evidenced-based methods for prevention (education, targeting, and referral: (34)) and involve empirically supported principles for attitude and opinion change (active participation: (41); source credibility: (20)).

Most recently, the USMC instituted the "Never Leave a Marine Behind" program as part of its ongoing efforts towards suicide prevention (40) (21). Initially this training was targeted towards the noncommissioned officer (NCO) corps, due to their role as frontline supervisors - the "backbone of the corps", but has since been expanded into 3 specific training groups: Non-NCO, NCO, and Staff NCO (SNCO) Officers. Training sessions are annual and are not permitted to exceed 30 Marines. These trainings are led

by a Sergeant who is a trained instructor for the Non-NCO and NCO groups and by a peer in the SNCO/Officer training to encourage discussion among students (11).

Concurrently, several DoD-wide initiatives also focus on suicide prevention within the USMC. The continued use and support for the DoDSER allows for the tracking and comparison of USMC suicides. Additionally, the Defense Centers of Excellence (DCoE) has initiated the "Real Warriors Campaign" aimed at reducing stigma through spotlighting service members who have sought assistance for mental health related issues. Finally, the DoD has also created several additional working groups (DoD Task Force, Defense Suicide Prevention Oversight Council, etc) to assist with tracking suicides, reviewing the efficacy of current suicide prevention initiatives, and planning future trainings aimed at reducing suicide throughout the DoD (21).

LACK OF PROGRAM EVALUATION STUDIES ON DOD SUICIDE PREVENTION PROGRAMS

Given that suicide is a significant, preventable DoD public health problem affecting both service members and mission readiness, suicide-prevention efforts have been tasked as high-priority. Due to this status, multiple suicide prevention efforts have been put forth (reviewed above) all requiring additional training and funding; however, these programs are currently lacking any significant evidence of successful outcomes (12) (35). Although anecdotal, it is noteworthy that the increase in and type of mandatory suicide prevention trainings have been poorly perceived by service members and ridiculed on websites with high military traffic such as "The Duffel Blog", both of which may reduce the potential acceptability and effectiveness of the training. Lastly, despite prevention efforts, the number of USMC suicides has continued to increase as evidenced by a nearly 25% increase from 2011 to 2012 (40). The call for reduction of

suicides combined with the limited evidence for the success of current programs suggests a need for new, culturally appropriate, sustainable, and evidence-based intervention strategies. Indeed, the DoD Task Force on Suicide Prevention provided recommendations to this effect in their executive summary of the report "The Challenge and the Promise: Strengthening the Force, Preventing Suicide and Saving Lives", specifically to "reduce stress on the force and on military families" (12), to "leverage and coordinate military community-based services, as well as local civilian community services" (12), and to ensure "every suicide prevention program initiated by the DoD or the services must contain a program evaluation component" (12).

PURPOSE AND SIGNIFICANCE OF CURRENT STUDY

This study examines the baseline data (i.e., pre-training) collected as part of an evaluation study on the *Never Leave a Marine Behind* suicide prevention program. The broad purpose of the study is (1) to provide a better understanding of the typical experiences of NCOs in terms of the most frequently observed stressors in distressed Marines and the most frequently used resources for risk mitigation, and (2) to generate lessons learned about ways in which the suicide prevention training programs in the USMC could be best adapted to the unique needs of NCOs based on their demographics, suicide exposure, opinions on suicide, and perceived barriers to care. To the best of our knowledge, this is the first effort within the DoD to first systematically understand (i.e., through research) the unique needs of a specific subgroup for the sole purpose of generating targeted suicide prevention programs.

Since the release of the 2010 DoD Task Force recommendations for suicide prevention, many initiatives have been refined throughout the DoD (i.e., stigma reduction

campaigns) and many were already in place within the USMC suicide prevention program. However, complete implementation of these recommendations is not yet complete. One such example is related to efforts to reduce stress on service members for the purpose of suicide prevention. To do so, it is necessary to understand what typical stressors military members frequently encounter. Suicide event reports provide thorough descriptions of objective stressors experienced by military decedents such as past legal, promotion, and deployment history. However, attempts to report more subjective or personal stressors such as financial concerns, exposure to suicide, and family losses are much less clear and high numbers of "don't know" responses are reported (12). Greater awareness of these stressors, in addition to knowledge of currently used resources for dealing with these stressors, would significantly aid in reducing stress and coordinating military and civilians resources. Moreover, information on what NCOs are experiencing in their day-to-day oversight of distressed Marines is expected to benefit suicide prevention training programs which can subsequently be designed and/or refined to directly address reported challenges.

The USMC's NLMB training, while acknowledging rank differences, is still being implemented with a "one size fits all" approach to units throughout the USMC. In fact, many of the suicide prevention training programs – across the DoD – are rolled out with a similar type of approach. Given that suicide prevention trainings, within the DoD, require significant financial and organizational resources, a useful approach *before* implementing a training program may be to in fact, learn about the unique training needs of the specific subgroup and/or military community. By taking this approach, suicide prevention training programs can be personalized and/or adapted to the unique needs of

subgroups of frontline supervisors based on factors such as typical situations faced in suicide prevention, prior exposure to suicide, opinions about suicide, and/or perceived barriers to care.

For instance, one may argue that the "every Marine is a rifleman" view is potentially limiting the acknowledgement of distinct differences between the USMC's three major communities: Ground, Logistics, and Air. Additionally, sex and educational differences among Marines may also be overlooked with this view, both of which directly correlate with military suicides (lower educational attainment and male gender, (12)). This non-descript lumping of Marines together could potentially limit the effectiveness of suicide prevention training programs by (1) not best responding to the potentially unique training needs and cultural factors that may be associated with these communities and (2) not best identifying potential community-specific assets that could utilized for suicide prevention purposes.

Given that a group's mission sets the "climate" for its current and future members (43), it is likely the stark differences in mission across these three communities (Ground, Logistics, and Air) lead to the selection and development of unique members. Ground units in the USMC, or Marine Divisions, are employed as ground combat elements and are tasked with conducting land assault operations and amphibious assault capabilities to naval forces (2d Mar Division Mission) These units are primarily composed of Marines serving in direct or indirect combat occupations such as infantry, artillery, tanks, and combat engineers. Logistics units, or Marine Logistics Groups, are tasked with a general support and sustainment role (2d Marine Logistics Group mission). These units are primarily composed of Marines serving in support occupations such as administration,

supply, communications, and maintenance. Air units, or Marine Air Wings, are tasked with combat air missions and air support operations. These units are primarily composed of Marine pilots and Marines in aviation support occupations (mechanics, administration, air traffic control). The distinct differences between these missions, occupations within groups, and requirements to serve in these roles anecdotally suggest the potential for distinct differences between groups.

Furthermore, a paucity of research exists on potential differences between military communities related to general opinions about suicide, perceived stigma, and attitudes toward help-seeking behavior – and how these factors may relate to the acceptability and efficacy of suicide prevention programs. One recent epidemiological study has identified differences in military suicide by occupation, suggesting service members in combat related military occupational specialties (MOSs) are at a greater risk (39). For example, within the USMC, infantry Marines account for a disproportionate number of suicides annually even when controlling for combat experience (42). Additionally, significant differences in the prevalence of posttraumatic stress disorder (PTSD) between ground, support, and air service members have also been identified (8). Specifically, a higher prevalence of PTSD was found in combat-related MOSs.

Identifying such differences and tailoring training to these subsets would meet the Task Force's recommendations to "strengthen strategic communication" (12). Additionally, understanding opinions towards suicide and potential attitudinal differences between groups of service members would assist in strategic communication aimed at suicide prevention. Such differences are currently unclear in research findings in this area. Recently, research has identified a link between negative attitudes towards

psychological problems and reduced treatment seeking behavior (22). Seemingly contradictory, studies conducted on foreign militaries have found that military service members have *less* negative attitudes towards the development of mental illness than civilians but are also less likely to believe people with mental illnesses should be integrated (15). This finding would seem to support literature that fears of being seen as "weak" or being treated differently by leadership were the most significant barriers to care in the U.S. military (19) and across multiple other militaries (17). A greater understanding of the relationship between opinions towards suicide and perceived barriers to treatment in the USMC would certainly aid in strategic communication efforts.

The Task Force also recommended specifically targeting clearance holders with suicide prevention training due to their potentially unique barriers to seeking treatment (12). This recommendation further supports a potential significant suicide prevention-related difference between USMC communities given that Marines with clearances are primarily in logistics or air MOSs (10).

In summary, given the identified shortcomings of current and past programs, recommendations for improvement, and the gap in literature on differences between communities in the USMC, this thesis accomplishes the following: (1) reports on the most commonly reported stressors observed by Marine NCOs in distressed Marines recognized to be at risk for suicide and the most common points of intervention; (2) examines the relationship among demographic factors, service-related factors, self-reported opinions on suicide, and perceived barriers to care among Marine NCOs; and (3) checks for any notable and significant differences among Air, Ground, and Logistics Marines based on their pre-training responses.

AIMS AND HYPOTHESES

Aim 1: To describe the demographic, occupational, and educational characteristics of the Marine NCO respondents.

Aim 2: To identify the most commonly observed stressors among distressed Marines and recommended installation resources/referrals as reported by the Marine NCO respondents.

Aim 3: To conduct a Principal Components Analysis of the Suicide Opinion Questionnaire and the Perceived Barriers to Care measure for interpretation of these study's findings and to compare this results with those reported in the existing literature.

Aim 4: To examine the association(s) among sex, education, prior military unit exposure to suicide, self-reported opinions on suicide, and self-reported perceived barriers to care.

Hypothesis 4A. Female sex, higher education, and prior military unit exposure to suicide will show a significant relationship with more accepting opinions towards suicide as measured by the Suicide Opinion Questionnaire (SOQ) total score and its associated factors.

Hypothesis 4B. Female sex, higher education, and prior military unit exposure to suicide will show a significant relationship with fewer perceived barriers to care as measured by Hoge et al.'s (2004) Barriers to Care total score and its associated factors.

Aim 5: To compare Marine NCO members of the Air, Ground, and Logistics communities on (1) self-reported opinions towards suicide, and (2) perceived barriers to care.

Hypothesis 5A: Marine NCO members of the Ground communities compared with Air and Logistics will demonstrate significantly less accepting opinions towards suicide as measured by the Suicide Opinion Questionnaire (SOQ) total score and its associated factors.

***Hypothesis 5B*:** Marine NCO members of the Air and Logistics communities compared with Ground will demonstrate significantly higher levels of perceived barriers to care for the specific items pertaining to security clearance (i.e., item 14) and command-related opinions (i.e., items 9, 10, and 11) as measured by Hoge et al.'s (19) Barriers to Care.

Hypothesis 5C: Marine NCO members of the Ground community compared with Air and Logistics will demonstrate significantly higher levels of perceived barriers to care for the specific items pertaining to organizational barriers (i.e., items 4, 5, 6, and 13) and stigma (i.e., items 7, 8, 9, 10, 11, 12, and 14) as measured by Hoge et al.'s (19) Barriers to Care.

CHAPTER 2: Methods

RESEARCH DESIGN

The current study uses a cross-sectional design to answer a series of research questions pertaining to a convenience sample of Marines who participated in the "Never Leave a Marine Behind" training in 2009-2010. Study analyses are based on data collected at the time of pre-training for the purposes of a one group pre-test/post-test program evaluation study of the Marine Corp's NLMB suicide prevention training program (16).

SAMPLE

A total of 1997 Marines completed the paper and pencil pre-training questionnaire immediately prior to receiving the NLMB training, 1972 of which were Marine NCOs. Surveys (n = 25) completed by Marines outside of the NCO pay grades and Navy corpsmen were excluded from the study analyses presented here. The Marines sampled were representative of the larger Marine enlisted population on all demographic factors with exception to pay grade and education (see Results section).

PROCEDURES

In October 2009, Headquarters Marine Corps (HQMC) mandated all Marine NCOs (approximately 67,000) to complete the NLMB suicide prevention training program. The Marine Corps Suicide Prevention Program (MCSPP) and researchers[1] at the Uniformed Services University of the Health Sciences formed a collaborative

[1] Principal Investigator, Dr. Marjan Holloway, Laboratory for the Treatment of Suicide-Related Ideation and Behaviors, Military Interdepartmental Purchase Request, USUHS, F172KJ.

relationship in order to implement an evaluation study of the NLMB program. Subsequently, all installations conducting the training were notified by the Marine Corps Suicide Prevention Program of the intent to conduct a program evaluation study of participating Marines. Upon receipt of notification of scheduled training sessions, the MCSPP sent study-related materials to every class held during the Institutional Review Board (IRB)-approved study period with the exception of those forward deployed.

At the beginning of scheduled training sessions, trainers were instructed to provide the trainees with IRB-approved written information about the program evaluation research and to subsequently leave the classroom. The informational handout included all the required elements of consent, indicated that completing the documents was optional and that the information provided would be confidential. Trainees were provided with 30 minutes prior to start of the training to "complete or not complete" the pre-test, and were instructed to place the document (completed or not) in a box positioned inside the room (in order to avoid possible coercion). The trainer returned to class after the 30 minutes and initiated the training session. This procedure was decided upon based on consultation with the Department of Navy Human Research Protection Program.

Following the completion of the pre-training surveys, all information was submitted to USUHS via the MCSPP for data entry and storage. Pre-training survey information was entered into SPSS via the usage of Snap Surveys scannable forms and later verified based on a manual data entry into SPSS (version 16.0). The de-identified data used for the current study was extracted from the larger database setup for the program evaluation study of the NLMB training and limited to the variables necessary to address the stated aims and hypotheses.

MEASURES

A copy of the pre-training questionnaires is provided in Appendix A. The sections below outline the information that has been specifically used to examine the aims and hypotheses of the current study.

Demographics. This section of the pre-training questionnaire included items to collect information on general demographics such as sex, marital status, ethnicity, military rank, and education.

Military Unit Exposure to Suicide (α = .64 in the current sample). This section of the pre-training questionnaire included 3 dichotomous (yes/no) items created to assess for prior exposure to suicide within one's military unit: (1) exposure to Marines with suicidal ideation (i.e., "In your current unit, have you ever encountered a Marine with suicidal thoughts?"), (2) exposure to Marines who have a made a suicide attempt (i.e., "In your current unit, have you encountered a Marine who attempted suicide?"), and/or (3) exposure to Marines who have died by suicide (i.e., "In your current unit, have you encountered a Marine who died by suicide?"). An affirmative response to any of these items was categorized as having had a prior exposure to suicide within one's military unit. If Marines indicated *yes* for any of the three items, they were categorized as having been exposed to suicide within their unit.

Suicide Opinion Questionnaire (SOQ; (13); α = .94 in the current sample). The SOQ is a 100-item self-report measure used to assess attitudes towards suicide and is composed of 65 attitudinal items and 35 "factual" items. The SOQ uses a 5-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree). Domino and colleagues originally conceived 8 subscales (unpublished, for full review see (25)) for this measure

but since then several factor structures and scales have been established for this measure with the most commonly used being the 5-factor structure (36; 37) and the 8 clinical scale model (14; 23).

The 5-factor structure includes: (1) Acceptability (e.g., "People with incurable diseases should be allowed to commit suicide in a dignified manner") with higher scores indicating accepting opinions towards suicide behavior in extreme situations, (2) Perceived Factual Knowledge (e.g., "Most suicides are triggered by arguments with a spouse") with higher scores indicating a willingness to accept as fact inaccurate statements related to suicide, (3) Social Disintegration (e.g., "The higher incidence of suicide is due to the lesser influence of religion") with higher scores indicating opinions that suicide behavior is the result of a weakened society, (4) Personal Defect (e.g., "I would feel ashamed if a member of my family committed suicide") with higher scores indicating opinions that persons who attempt or commit suicide are in someway weak or defective, and (5) Emotional Perturbation (e.g., "Most persons who attempt suicide are lonely or depressed") with higher scores indicating opinions that those who attempt or commit suicide are emotionally distraught or mentally ill (36; 37).

The 8 clinical scale model includes: (1) Suicide Reflects Mental Illness (e.g., "Most persons who attempt suicide are lonely or depressed") with higher scores indicating opinions attributing suicide behavior to mental illness, (2) Cry for Help (e.g., " Those who threaten to commit suicide rarely do so") with higher scores indicating opinions that suicide behavior is an attempt to gain attention or assistance, (3) Right to Die (e.g., " Suicide prevention centers actually infringe on a person's right to take his life") with higher scores indicating opinions that people have a right to choose suicide as

an option, (4) Importance of Religion (e.g., "The higher incidence of suicide is due to the lesser influence of religion") with higher scores indicating opinions that suicide behavior is related to a lack of religious conviction or influence, (5) Impulsivity (e.g., "Most suicide are triggered by arguments with a spouse") with higher scores indicating opinions that suicide is an impulsive act or often happens without warning, (6) Suicide is Normal (e.g., "Almost everyone has at one time or another thought about suicide") with higher scores indicating opinions that suicide can be considered normal in many circumstances, (7) Suicide Reflects Aggression/Anger (e.g., "Many suicide notes reveal substantial anger towards the world") with higher scores indicating opinions that suicide behavior results from feelings of anger or are attempts to "get even", and (8) Suicide is Morally Bad (e.g., "Suicide is a very serious moral transgression") with higher scores indicating opinions that suicide is not an acceptable option.

The following scores will be used for analysis: (1) total score; (2) scores on each of the 5 factors (36; 37); (3) scores on each of the 8 clinical scale model (14); and (4) scores on each of the factors identified through a principal components analysis for this study.

Perceived Barriers to Care (PBTC (19); $\alpha = .88$ in the current sample). The PBTC measure was developed to assess perceived barriers to mental health treatment related to stigmatization of receiving such services. Thirteen items are presented on a 5-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree) with higher scores demonstrating fewer perceived barriers to care. A sample item is the following: "I don't trust mental health professionals." This measure was adapted for the current study by (1) making the items Marine specific (e.g., "It would be embarrassing for a Marine")

and (2) adding a 14th item specific to security clearances due to the Suicide Prevention Task Force recommendation (i.e. "A Marine would lose a security clearance").

Previous factor structures including this measure have identified 3 specific themes: (1) access or organizational barriers, (2) negative perceptions of mental health care or negative attitudes towards treatment, and (3) perceived unit stigma or stigma (7; 22). Noteworthy, the Kim and colleagues structure included additional items from separate measures and Brown and colleagues used a dichotomous high/low method for interpreting their factors.

The following scores will be used for analysis: (1) total score; (2) each of the factors identified through a principal components analysis for this study.

HUMAN SUBJECTS PROTECTION

Both the Uniformed Services University of the Health Sciences IRB and the Department of the Navy IRB approved the program evaluation study. Waiver of the requirement for consent was obtained given the minimal risk nature of the study. Study participants were not compensated for their participation in this study due to their active duty military status. For the purposes of the current study, the appropriate research forms required by USUHS to register the student thesis have been completed.

CHAPTER 3: Results

MISSING DATA

Prior to conducting the study analyses, descriptive statistics were run using SPSS 20 on 1972 cases to identify missing data. A total of 198 (9.9%) of participants did not complete at least 85% of the SOQ and a total of 50 (2.5%) of participants did not complete at least 85% of the PBTC. Further, a total of 34 (1.7%) of participants did not complete 85% of both the PBTC and SOQ. Therefore, a total of 214 case-wise deletions were made. The decision to delete these cases was made based on percent missing and due to the relative importance of each of these measures with regards to the aims of the study. This decision is supported by literature suggesting casewise deletion when 10-20% of data is missing (5; 33) and resulted with retention of approximately 90% of the original sample. Following the case-wise deletion, each item of both the SOQ and PBTC measures were left with a less than 1% missing value. Comparisons were conducted on the demographic data of retained versus deleted cases of Marine NCO respondents to determine whether non-random attrition occurred finding no significant results; demographic characteristics are provided in Table 1.

The SPSS 20 replace with mean function was used for all remaining missing items in the SOQ and PBTC measures. Sensitivity analyses, in which the most extreme (1 = strongly agree and 5 = strongly disagree) options were used to replace the missing data, were conducted for all aims of the study to determine whether this method significantly altered the results. Only one significant difference was found, specifically, female sex was no longer a significant predictor of acceptability in the Rogers and DeShon 5 factor model.

DEMOGRAPHIC, OCCUPATIONAL, AND EDUCATIONAL CHARACTERISTICS OF THE MARINE NCO RESPONDENTS (AIM 1)

Table 1 provides information on the demographic, occupational, and educational characteristics of the Marine NCO respondents. In general, Marine NCO respondents were similar to the USMC general population in both demographics and occupation (see Table 2). The respondents were primarily male, approximately half were married, and nearly 90% endorsed a high school diploma or some college. The current sample had a higher level of educational attainment than the USMC enlisted population average (42).

MOST COMMONLY OBSERVED STRESSORS AMONG DISTRESSED MARINES AND RECOMMENDED INSTALLATION RESOURCES/REFERRALS (AIM 2)

Figures 1 and 2 present a summary of the most commonly observed stressors among distressed Marines and recommended installation resources/referrals. The most frequently encountered distress-related issues among Marines were the following: (1) relationships (59.8%); (2) work problems (42.3%); (3) financial concerns (42.2%); and (4) alcohol (23.2%). In addition, 9.3% of respondents endorsed physical health as another observed stressor among distressed Marines. Other mentioned stressors included family concerns and pending deployments.

The most frequently used installation resources by the Marine NCO respondents, as a referral source for a distressed Marine during the past month, were the following: (1) chain of command (29.9%); (2) chaplains (22.2%); (3) Marine and family services (13.6%); and (4) unit medical (10.7%). In addition, Substance Abuse Rehabilitation Programs (SARP) was endorsed by 5.6% of respondents. Other mentioned resources included military one source and the Navy and Marine Corps Relief Society.

PRINCIPAL COMPONENTS ANALYSES OF SOQ AND PBTC (AIM 3)

Suicide Opinion Questionnaire. A principal components analysis (PCA) was conducted on all 100 items of the SOQ using PCA and a VARIMAX rotation. Table 3 shows the loadings of each item to its respective factors (items < .40 not included). Four distinct factors were visible on the Scree plot (Figure 3) and the analysis was repeated saving these four factors. The Kaiser-Meyer-Olkin measure of sampling adequacy was .95, above the recommended value of .6, and the Bartlett's test of sphericity was significant, (χ^2 (4950) = 57947.73, $p < .01$). PCA was used to identify and compute composite scores for the underlying factors of the SOQ. The first factor explained 16.0% of the variance, the second factor explained 8.6% of the variance, the third factor explained 3.5%, and the fourth factor explained 2.4% of the variance. This four-factor model explained a cumulative total of 30.6% of the variance in the SOQ; despite its low percentage, factor models remain the preferred method of interpretation as opposed to the total score (3).

Items that most strongly correlated with the first identified factor indicated erroneous assumptions about suicide (e.g. "Many victims of fatal automobile accidents are actually unconsciously motivated to commit suicide" L = .70; "Most suicide victims are older with little to live for" L = .65) and are presented in table 3a. Items that most strongly correlated with the second identified factor suggested emotional perturbation (e.g. "Individuals who are depressed are more likely to commit suicide" L = .59; "Long term self-destructive behaviors, such as alcoholism, may represent unconscious suicide attempts" L = .53) and are presented in table 3b. Items that most strongly correlated with the third identified factor suggested opinions related to the acceptability of suicide (e.g. "Some people are better off dead" L = .60; "We should have suicide clinics where people

who want to die could do so in a painless and private manner" L = .48) and are presented in table 3c. Items that most strongly correlated with the fourth identified factor in this analysis suggested opinions related to stigma associated with suicide (e.g., "Those who commit suicide are cowards who cannot face life's challenges" L = .63; "Those people who attempt suicide are usually trying to get sympathy from others" L = .51) and are presented in table 3d.

Due to the constructs each factor appears to measure, these factors have been labeled as (1) Erroneous Assumptions about Suicide (EAS), (2) Emotional Perturbation 2(EP2), (3) Acceptability 2 (AC2), and (4) Stigma Associated with Suicide (SAS) for the remainder of this thesis. Borrowing from the 5-factor model proposed by Rogers and DeShon (1992), EP2 and AC2 are similarly named due to strong correlations with similar items on these factors.

Perceived Barriers to Care. A PCA was conducted on the 14 items of the PBTC measure using PCA and a VARIMAX rotation. Table 4 shows the loadings of each item to its respective factors (items < .40 not shown). Three distinct factors were visible on the Scree plot (Figure 4) and the analysis was repeated saving these three factors. The Kaiser-Meyer-Olkin measure of sampling adequacy was .90, above the recommended value of .6, and the Bartlett's test of sphericity was significant, (χ^2 (91) = 9888.41, $p <$ .01). PCA was used to identify and compute composite scores for the underlying factors of the PBTC measure. The first factor explained 39.1% of the variance, the second factor explained 12.4% of the variance, and the third factor explained 7.3% of the variance. This three-factor model explained a cumulative total of 58.9% of the variance in the PBTC measure.

Items most strongly correlated with the first factor were related to perceived unit stigma and harm to career (e.g., "Members of the Marine's unit might have less confidence in him/her." L = .86; "The Marines unit leadership might treat him/her differently." L = .85) and are presented in table 4a. Items most strongly correlated with the second factor were related to organizational/cultural barriers (e.g., "There would be difficulty getting time off work for treatment for a Marine." L = .75; "It is difficult to schedule an appointment for a Marine." L = .71) and are presented in table 4b. Items most strongly correlated with the third factor were related to individual barriers to care (e.g., "Marines don't know where to get help." L = .82; "Marines don't have adequate transportation." L = .59) and are presented in table 4c. The first two factors identified through this analysis share multiple common items with a previous factor analysis on the measure (22). The three identified factors will be referred to as (1) Perceived Unit Stigma and Harm to Career, (2) Organizational/Cultural Barriers, and (3) Individual Barriers to Care for the remainder of this thesis.

ASSOCIATIONS AMONG SEX, EDUCATION, PRIOR MILITARY UNIT EXPOSURE TO SUICIDE, SELF-REPORTED OPINIONS ON SUICIDE, AND SELF-REPORTED PERCEIVED BARRIERS TO CARE (AIM 4)

Opinions on Suicide. Analyses involving the Suicide Opinion Questionnaire were first conducted with the SOQ total score and the 4 factors identified in this study. Secondary analyses were conducted using previously established factor models (5 factor: (37); 8 Clinical Scale model: (14)) for purposes of comparison.

SOQ Total Score

A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates

degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and the SOQ total score as the dependent factor. No significant relationship was found among these factors, $R^2 = .00$, F (3, 1754) = 1.48, $p = .22$, *ns*.

Factors Identified Through Principal Components Analysis *(Table 5a)*

Erroneous Assumptions about Suicide (EAS): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and EAS as the dependent factor. A significant relationship was found, where these factors accounted for 12% of the variance in EAS, $R^2 = .01$, F (3, 1754) = 8.52, $p < .01$. Specifically, education showed a significant negative correlation with Marine NCOs' erroneous assumptions about suicide $\beta = .11$, t (1755) = 4.71, p < .01. Neither sex, β = .04, t (1755) = 1.53, $p = .13$ or prior military unit exposure to suicide β = -.01, t (1755) = -.20, $p = .85$ significantly predicted Marine NCOs' erroneous assumptions about suicide.

Emotional Perturbation 2 (EP2): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and EP2 as the dependent factor. A significant relationship was found, where these factors accounted for 17.6% of the variance in EP2, $R^2 = .03$, F (3, 1754) = 18.67, $p < .01$. Specifically, higher education, β = -.15, t (1755) = -6.21, $p < .01$ and female sex, β = -.08, t (1755) = -3.24, $p < .01$ predicted Marine NCOs' high endorsement of emotional perturbation as a reason for

suicide. Prior military exposure to suicide, $\beta = -.04$, t (1755) = -1.65, $p = .10$ did not show any significant relationship with explanations for suicide.

Acceptability (AC2): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and AC2 as the dependent factor. A significant relationship was found, where these factors accounted for 7.6% of the variance in AC2, $R^2 = .01$, F (3, 1754) = 3.44, $p < .05$. Specifically, female sex predicted Marine NCOs low acceptability of suicide, $\beta = .07$, t (1755) = 2.77, $p < .05$. Neither prior military unit exposure to suicide, $\beta = .03$, t (1755) = -1.45, $p = .15$ or level of education, $\beta = .02$, t (1755) = .65, $p = .52$ showed any significant relationship with acceptability of suicide.

Stigma Associated with Suicide (SAS): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and SAS as the dependent factor. A significant relationship was found, where these factors accounted for 10.6% of the variance in SAS, $R^2 = .01$, F (3, 1754) = 6.65, $p < .01$. Specifically, higher education, $\beta = .08$, t (1755) = 3.33, $p < .01$ and female sex, $\beta = .05$, t (1755) = 2.62, $p < .01$ predicted Marine NCOs were more likely to disagree with stigma statements. Prior military unit exposure to suicide did not show a significant relationship with opinions related to stigma associated with suicide, $\beta = .03$, t (1755) = .70, $p = .49$.

Five-Factor Structure *(Table 5b)*

Acceptability (AC): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and AC as the dependent factor. A significant relationship was found, where these factors accounted for 9.0% of the variance in acceptability $R^2 = .01$, F (3, 1754) = 4.82, $p < .01$. Specifically, female sex, $\beta = .05$, t (1755) = 2.28, $p < .05$ and higher education, $\beta = .06$, t (1755) = 2.55, $p < .05$ predicted Marine NCOs low acceptability of suicide. Exposure to suicide did not significantly predict opinions of acceptability, $\beta = -.04$, t (1755) = -1.54, $p = .12$. Female sex was no longer a significant predictor of acceptability in the sensitivity analysis; therefore this result should be interpreted with caution.

Perceived Factual Knowledge (PFK): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and PFK as the dependent factor. A significant relationship was found, where these factors account for 13.4% of the variance in perceived factual knowledge, $R^2 = .02$, F (3, 1754) = 10.70, $p < .01$. Specifically, female sex, $\beta = .05$, t (1755) = 2.00, $p < .05$ and higher education, $\beta = .12$, t (1755) = 5.14, $p < .01$ predicted Marine NCOs' would be less willing to agree with inaccurate statements related to suicide. Exposure to suicide did not significantly predict perceived factual knowledge, $\beta = .00$, t (1755) = .07, $p = .95$.

Social Disintegration (SD): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent,

some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and SD as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = 2.42, $p = .07$.

Personal Defect (PD): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and PD as the dependent factor. A significant relationship was found, where these factors accounted for 12.8% of the variance in opinions identifying suicide as the result of a personal defect, $R^2 = .02$, F (3, 1754) = 9.75, $p < .01$. Specifically, female sex, $\beta = .08$, t (1755) = 3.15, $p < .01$ and higher education, $\beta = .10$, t (1755) = 4.17, $p < .01$ predicted Marine NCOs opinion that suicide is the result of a personal defect. Exposure to suicide did not significantly predict opinions related to personal defect, $\beta = .00$, t (1755) = .09, $p = .93$.

Emotional Perturbation (EP): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and EP as the dependent factor. A significant relationship was found, where these factors accounted for 11.0% of the variance in opinions identifying suicide as a result of emotional perturbation, $R^2 = .01$, F (3, 1754) = 7.10, $p < .01$. Specifically, female sex, $\beta = -.05$, t (1755) = -2.00, $p < .05$, higher education, $\beta = -.08$, t (1755) = -3.31, $p < .01$, and exposure to suicide, $\beta = -.05$, t (1755) = -2.12, $p < .05$ predicted Marine NCOs were more likely to see suicide as the result of a emotional perturbation.

8 Clinical Scales *(Table 5c)*

Suicide Reflects Mental Illness (SRMI): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and SRMI as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = .06, $p = .98$.

Cry for Help (CFH): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and CFH as the dependent factor. A significant relationship was found, where these factors accounted for 7.9% of the variance in opinions identifying suicide as a cry for help, $R^2 = .01$, F (3, 1754) = 3.65, $p < .05$. Specifically, higher education, $\beta = .07$, t (1755) = 3.01, $p < .01$ was negatively associated with Marine NCOs opinion that suicide is a cry for help. Sex, $\beta = .02$, t (1755) = .94, $p = .35$ and exposure to suicide, $\beta = -.01$, t (1755) = -.45, $p = .66$ were not significant predictors of opinions related to suicide as a cry for help.

Right to Die (RTD): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and RTD as the dependent factor. A significant relationship was found, where these factors accounted for 7.3% of the variance in opinions a person has a right to die, $R^2 = .01$, F (3, 1754) = 3.14, $p < .05$. Specifically, female sex, $\beta = .06$, t (1755) = 2.55, $p < .05$ predicted Marine NCOs would

be less likely to hold the opinion that a person has the right to die by suicide. Education, $\beta = .02$, t (1755) = .79, $p = .43$ and exposure to suicide, $\beta = -.04$, t (1755) = -1.48, $p = .14$ were not significant predictors of opinions related to a person's right to die.

Importance of Religion (IOR): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and IOR as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = .99, $p = .40$.

Impulsivity (IMP): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and IMP as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = 2.03, $p = .11$.

Suicide is Normal (SIN): A multiple regression was conducted using sex [male, female], education no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and SIN as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = 2.00, $p = .11$.

Suicide Reflects Aggression/Anger (SRAA): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and

SRAA as the dependent factor. Findings were not significant, $R^2 = .00$, F (3, 1754) = 1.23, $p = .30$.

Suicide is Morally Bad (SIMB): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and SIMB as the dependent factor. A significant relationship was found, where these factors accounted for 10.4% of the variance in opinions that suicide is morally bad, $R^2 = .01$, F (3, 1754) = 6.37, $p < .01$. Specifically, female sex, $\beta = .10$, t (1755) = 4.32, $p < .01$ predicted Marine NCOs were less likely to see suicide as a serious moral infraction. Education, $\beta = .02$, t (1755) = .01, $p = .99$ and exposure to suicide, $\beta = -.02$, t (1755) = -.68, $p = .50$ were not significant predictors of opinion related to the morality of suicide.

Perceived Barriers to Care

The second step of this aim was to evaluate the relationship between sex, education, and exposure to suicide with perceived barriers to care as measured through the measure's total score and identified factors.

Total Score (Table 6)

A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and the PBTC total score as the dependent factor. A significant relationship was found, where these factors accounted for 15.2% of the variance in opinions perceived barriers to care, $R^2 = .02$, F (3, 1754) = 13.80, $p < .01$. Specifically,

education, β = -.07, t (1755) = -2.85, $p < .01$ and exposure to suicide, β = -.13, t (1755) = -5.41, $p < .01$ were positively associated with Marine NCOs being more likely to perceive barriers to care. Sex, β = -.03, t (1755) = -1.23, $p = .22$ was not a significant predictor of perceived barriers to care.

Factors Identified Through Principal Components Analysis (Table 6)

Perceived Unit Stigma and Harm to Career (PUSHC): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and the PUSHC score as the dependent factor. A significant relationship was found, where these factors accounted for 13.9% of the variance in opinions perceived barriers to care, $R^2 = .02$, F (3, 1754) = 11.55, $p < .01$. Specifically, education, β = -.07, t (1755) = -2.69, $p < .01$ and exposure to suicide, β = -.12, t (1755) = -4.41, $p < .01$ were positively associated with Marine NCOs reporting perceived unit stigma and potential harm to career as a barrier to care. Sex, β = -.02, t (1755) = -.77, $p = .44$ was not a significant predictor of stigma-related perceived barriers to care.

Organizational/Cultural Barriers to Care (OCBTC): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and the OCBTC score as the dependent factor. A significant relationship was found, where these factors accounted for 10.1% of the variance in perceived organizational and cultural barriers to care, $R^2 = .01$, F (3, 1754) = 5.99, $p < .01$. Specifically, education, β = -.06, t

(1755) = -2.32, $p < .05$ and exposure to suicide, β = -.08, t (1755) = -3.34, $p < .01$ were positively associated with Marine NCOs reporting organizational and cultural related barriers to care. Sex, β = -.01, t (1755) = -.57, $p = .57$ was not a significant predictors of organization-related perceived barriers to care.

Individual Barriers to Care (IBTC): A multiple regression was conducted using sex [male, female], education [no high school diploma, high school diploma or equivalent, some college no degree, associates degree, bachelors degree or higher], and prior military unit exposure to suicide [yes, no] as independent factors and the IBTC score as the dependent factor. A significant relationship was found, where these factors accounted for 12.8% of the variance in individual barriers to care, $R^2 = .02$, F (3, 1754) = 9.75, $p < .01$. Specifically, sex, β = -.06, t (1755) = -2.29, $p < .05$ and exposure to suicide, β = -.11, t (1755) = -4.56, $p < .01$ were positively associated with Marine NCOs reporting perceived individual barriers to care. Education β = -.03, t (1755) = -1.37, $p = .17$ was not a significant predictor of individual perceived barriers to care.

COMPARISONS OF MARINE NCOS (AIR, GROUND, AND LOGISTICS) (AIM 5)

The fifth aim of this study was to examine whether potential differences exist in opinions towards suicide and perceived barriers to care among the Logistics, Air, and Ground components of the USMC.

Opinions toward Suicide

SOQ Total Score: A one-way analysis of variance (ANOVA) was conducted to determine if significant differences existed between the Logistics (M = 304.4, SD = 34.2), Air (M = 306.5, SD = 32.00), and Ground (M = 305.1, SD = 31.4) components. No significant between group differences were found, F (2, 1757) = .55, $p = .58$.

Factors Identified Through Principal Components Analysis (Table 7a): A multivariate analysis of variance (MANOVA) was conducted to determine if significant differences existed between Logistics, Air, and Ground components on any of the 4 factors finding significant results for EP2, F (2, 1757) = 3.20, $p < .05$. Specifically, Marines in the air component were significantly less likely to attribute suicide to emotional perturbation than Marines in logistics.

Five-Factor Model (Table 7b): A multivariate analysis of variance (MANOVA) was conducted to determine if significant differences existed between Logistics, Air, and Ground components on any of the five SOQ factors. No significant between group differences were found.

Eight Clinical Scale Model (Table 7c): A MANOVA was conducted to determine if significant differences existed between Logistics, Air, and Ground components on any of the eight factors. Significant between-group differences were found for impulsivity, F (2, 1757) = 3.12, $p < .05$. Specifically, Marines in the air component were significantly less likely to attribute suicide to impulsivity than Marines in logistics. Levene's tests for the homogeneity of variance were not significant for significant findings.

Barriers to Care (Table 8)

Total Score: A one-way analysis of variance (ANOVA) was conducted to determine if significant differences existed between Logistics (M = 43.8, SD = 9.0), Air (M = 44.8, SD = 8.7), and Ground (M = 43.6, SD = 8.9) components on perceived barriers to care failing to find significant results, F (2, 1757) = 2.45, $p = .09$.

Command Opinion and Clearance: A one-way analysis of variance (ANOVA) was conducted to determine if significant differences existed between Logistics (M = 2.9, SD = .8), Air (M = 3.0, SD = .8), and Ground (M = 3.0, SD = .8) components on perceived barriers to care related to command opinion and loss of clearance failing to find significant results, F (2, 1757) = 1.08, p = .34.

Factors Identified Through Principal Components Analysis: A multivariate analysis of variance (MANOVA) was conducted to determine if significant differences existed between Logistics, Air, and Ground components on any of the 3 factors finding significant results for Organizational Barriers, F (2, 1757) = 5.09, $p < .01$ and Individual Barriers to Care, Brown-Forsythe (2, 1439.51) = 3.89, $p < .05$ (Levene's test significant, $p < .05$). Specifically, Marines in the ground component were significantly more likely to identify organizational/cultural barriers as perceived barriers to care and Marines in the logistics component were significantly more likely to identify individual barriers as a perceived barrier to care.

Supplemental Analyses (Table 9)

Supplemental, by-item, analyses on the PBTC measure identified only 3 items where components significantly differ. Items that questioned perceptions of ease in getting time off work (i.e., "There would be difficulty getting time off work for treatment for a Marine") and cost of mental health treatment (i.e., "Mental health care costs too much money for a Marine") elicited a significantly stronger agreement from Marines from the Ground component than Marines from the Air and Logistics components. Marines from the Air component were significantly less likely to see mental health

treatment as a potential harm for their careers (“It would harm a Marine’s career”) than Marines from the Ground and Logistics components.

CHAPTER 4: Discussion

This thesis utilized baseline data (i.e., pre-training) from 1758 Marine NCOs, collected as part of an evaluation study on the *Never Leave a Marine Behind* suicide prevention program. The broad objectives of the study were threefold: (1) to gain a better understanding of the typical experiences of NCOs in terms of the most frequently observed stressors in distressed Marines and the most frequently used resources for risk mitigation; (2) to generate lessons learned for the best adaptation of suicide prevention training programs in the USMC to the unique needs of NCOs based on their demographics, suicide exposure, opinions about suicide, and perceived barriers to care; and (3) to compare Air, Ground, and Logistics Marines on opinions about suicide and perceived barriers to care. In addition, to best capture the study findings on opinions about suicide as well as perceived barriers to care, principal components analyses were conducted on the SOQ and the PBTC measures. As stated previously, to the best of our knowledge, this is the first effort within the DoD to first systematically understand (i.e., through research) the unique needs of a specific subgroup for the sole purpose of generating targeted suicide prevention programs.

DEMOGRAPHICS

The Marine NCOs participants in this study were primarily male, approximately half were married, and nearly 90% had a high school diploma or some college. Overall, in terms of demographics, the Marine NCOs in this study appear to be representative of the greater USMC as a whole, with the exceptions of rank and education (only NCOs

were included which allowed for a more educated sample), suggesting that these findings may be generalizable to, at a minimum, the enlisted ranks for the USMC. Most importantly, the findings of this study based on a large sample size of 1758 (recruited from several installations) appear to also be generalizable to an estimated 51,812 NCOs accounted for in the 2013 Marine Corps demographic report.

COMMONLY ENCOUNTERED DISTRESS-RELATED ISSUES AND REFERRALS PROVIDED

The most frequently encountered distress-related issues among Marines – observed and reported by Marine NCOs who serve as frontline supervisors – were relationships, work problems, finances, and alcohol-related issues. Notably, these stressors are common among Marines who die by suicide (28). Of these, alcohol-related issues were identified as a predictor of suicide along with male sex and other non-military specific variables (24). These findings lend support to previous literature that "normal" stress, as opposed to combat or deployment-related stressors are the most common found in service members.

The installation resources most frequently used by the Marine NCOs, as a referral source for a distressed Marine during the past month, were the chain of command followed by chaplains, Marine and Family Services, and then unit medical. These findings are of interest in that they demonstrate mental health resources may be being seriously under-utilized; only 10.7% of Marine NCO respondents in this study reported referring Marines to medical whereas more than 20% reported referring distressed Marines to chaplains and nearly 30% reported using the chain of command. The use of the chain of command as the number one referral resource by Marine NCOs is possibly related to one's perception of needing to handle a situation "in house", or within the unit

prior to involving outside resources. Anecdotally, this may be stigma producing in that one potentially would not want their supervisor or co-workers to be the first ones notified in a mental health crisis. This anecdotal evidence is supported by findings in this study, specifically; command opinions were the most reported barriers to care with over 65% of the sample reporting they either strongly agree or agree that their unit may have less confidence in them or that their leadership would treat them differently if they were to seek mental health counseling. Additionally, significant evidence exists for the value of in obtaining mental health care for distress-related issues. While the effectiveness of mental health care is outside the scope of this study, notable findings include the significant reductions in addiction following brief mental health interventions (29) as well as the demonstrated effectiveness of suicide screenings and psychotherapy at reducing suicides (32). Increased education on available resources for mental health care as well as encouragement by leadership to not solely rely on chain of command as a mechanism of getting a distressed Marine to available helping services in the community may serve to reduce stigma while ensuring Marines receive adequate care.

PRINCIPAL COMPONENT ANALYSES

The third aim of this study was to conduct a principal components analysis on both the Suicide Opinion Questionnaire and Perceived Barriers to Care measures given the large sample size in this study. The four factors identified for the SOQ consisted of the following and accounted for approximately 30% of the common variance: (1) Erroneous Assumptions about Suicide; (2) Emotional Perturbation; (3) Acceptability; and (4) Stigma Associated with Suicide. Two of these four identified factors for the SOQ (i.e., emotional perturbation and acceptability) were directly comparable to the previously

published Rogers and DeShon factor structure for the SOQ. However, two new factors (i.e., erroneous assumptions about suicide and stigma associated with suicide) appear to uncover additional constructs within the measure, which had not been previously identified. The relatively low percentage of common variance found suggests a poor fit for this model (27). Comparatively, the five-factor model for the SOQ on a sample of 452 college students accounted for 77% of the overall variance (37). Given the comparably large sample size of this study and the low variance accounted for, one may argue that the SOQ may not be the most useful measure for evaluating suicide opinions among military service members.

The three factors identified for the PBTC consisted of the following and accounted for approximately 59% of the variance in response to the measure: (1) Perceived Unit Stigma and Harm to Career; (2) Organizational/Cultural Barriers; and (3) Individuals Barriers to Care. These identified factors share similar characteristics to the previously established factors (22) but in contrast, only one additional item was included as opposed to the six added to create the previous factors. The findings were also comparable to the previous analysis in that Kim and colleagues (22) identified three factors accounting for 66% of the variance with a sample size of 2,623 military service members. The replication in findings suggests the factors identified here are distinct constructs that can be interpreted as relating to health seeking behaviors.

EDUCATION, SEX, PRIOR EXPOSURE TO SUICIDE WITHIN MILITARY UNIT, AND SUICIDE OPINIONS

The fourth aim of this study was to first examine the relationships among multiple demographic, military, and prior military unit exposure to suicide factors with opinions regarding suicide. Female sex, higher education, and prior military unit exposure to

suicide were expected to show a significant relationship with more accepting opinions towards suicide as measured by the SOQ total score and its associated factors. The study findings did not support a significant relationship among these noted factors and SOQ total score.

Based on the four factors identified through this study's principle components analysis, Marine NCOs with higher levels of education were significantly less likely to make erroneous assumptions about suicide and less likely to agree with stigma statements associated with suicide, conversely, they were more likely to endorse emotional perturbation as a reason for suicide. Similarly, based on the SOQ 5-factor structure, Marine NCOs with higher levels of education were significantly less likely to endorse inaccurate statements about suicide, and more likely to credit emotional perturbation as a reason for suicide. Surprisingly, however, Marine NCOs with higher levels of education were less accepting of suicide and most likely to attribute suicide to personal defect. Based on the SOQ 8-factor structure, Marine NCOs with higher levels of education were less likely to see suicide as a cry for help.

A paucity of literature available on education differences in the SOQ exists, however, previous findings have identified a greater acceptance of suicide in more educated nurses (right to die; (1)) as well as opinions that suicide is more "normal" in more experienced health care workers (4). Additional research has shown that individuals tend to become more accepting of suicide and view it as more normal as they age (38). These findings may suggest a curvilinear relationship exists between education and opinions on suicide. More specifically, opinions become less accepting early on in

one's education. It may also be interpreted that Marine NCO's are culturally unique to previous samples studied with this measure.

Female Marine NCOs compared with their male counterparts were significantly more likely to view suicide as a result of emotional perturbation and less likely to agree with stigma related statements in reference to suicide – but were surprisingly less acceptable of suicide. The SOQ 5-factor structure analyses revealed that females were less accepting of suicide, less willing to agree with inaccurate statements about suicide, and more likely to see suicide as a result of emotional perturbation – yet more likely to see suicide as a result of personal defect. In terms of the SOQ 8-factor structure, females were less likely to agree to the right to die of the suicidal individual and less likely to view suicide as morally bad.

Previous literature on sex differences in suicide opinions has been mixed. Similar to these findings, male sex has been found to be associated with more accepting views of suicide (6). Additionally, female sex has been previously associated with opinions that suicide was a cry for help (4). Conflicting research has found differences between men and women on impulsivity; specifically that men were more likely than women to hold the opinion that suicide was impulsive (31) and that men were less likely than women to hold the opinion that suicide was impulsive (14). The findings presented here remain consistent across factors (acceptance, right to die, morally bad) and with sex differences on acceptability (6) suggesting that female sex is associated with less accepting opinions of suicide in Marine NCOs.

Finally, in terms of prior exposure to suicide in one's military unit, the only significant finding was in reference to emotional perturbation. Marine NCOs with prior

exposure to suicide within their military unit, compared to those without, were significantly more likely to view suicide as a result of emotional perturbation. This finding suggests that those with prior exposure to suicide are more knowledgeable about suicide stemming from mental health issues and psyche ache. Conversely, previous studies in civilian samples have found that exposure to suicide (through video) was associated with less accepting opinions (30) and prior personal history with suicide (attempt and/or ideation) was associated with accepting opinions as well as opinions that suicide is more impulsive and less related to mental illness (26).

EDUCATION, SEX, PRIOR EXPOSURE TO SUICIDE WITHIN MILITARY UNIT, AND PERCEIVED BARRIERS TO CARE

Subsequent to the SOQ analyses, the relationships among multiple demographic, military, and prior military unit exposure to perceived barriers to care were examined. Female sex, higher education, and prior military unit exposure to suicide were expected to show a significant relationship with fewer perceived barriers to care. Contrary to expectations, Marine NCOs with higher education and prior exposure to suicide were more likely to perceive general barriers to care. Higher education and prior exposure to suicide were also predictive of barriers related to perceived unit stigma and harm to career as well as organization/cultural barriers. These findings clearly reflect that education and experience seem to possibly confirm one's opinions on barriers to care. Those who are naïve in terms of their education and experience appear to have fewer perceived barriers to care. A final finding in relation to the PBTC measure was that female Marine NCOs and prior exposure to suicide within one's military unit were predictive of perceived individual barriers to care.

COMPARISON OF AIR, GROUND, AND LOGISTICS

The fifth and final aim of this study was to determine whether significant differences in suicide opinions or perceived barriers to care existed between the 3 major USMC components (Air, Ground, and Logistics). Marine NCO members of the Ground communities, compared to Air and Logistics were expected to demonstrate significantly less accepting opinions towards suicide as measured by the SOQ total score and its associated factors. Study findings did not support this hypothesis. The only significant difference in suicide opinion among components indicated that Marines in the Air component were significantly less likely than Logistics to attribute suicide to impulsivity and less likely than Logistics to attribute suicide to emotional perturbation. Therefore, one interpretation of this finding is that Marine NCOs in the Air components appear to demonstrate more stigma-related attitudes towards suicide where the accountability for suicide is placed on the individual rather than his or her state of mind.

Another hypothesis was that Marine NCO members of the Air and Logistics communities compared with Ground would demonstrate significantly higher levels of perceived barriers to care for the specific items pertaining to security clearance and command related opinions as measured by the PBTC. This hypothesis was only partially supported. No significant differences existed across components for clearance or command opinion barriers. Marines in the Ground component endorsed a significantly higher perception of organizational/cultural barriers to care. Marines in Logistics endorsed a higher perception of individual barriers. Moreover, in supplementary analyses, Marine NCOs in the Ground component were more likely to report difficulty in getting time off work for treatment as a barrier and Marine NCOs in the Air component were least likely to report potential harm to career as a barrier. Notably, these findings

match expectations with regards to ground units but are in sharp contrast to what would be expected of the air component suggesting communication to minimize stigma in this community may be having a positive effect.

Implications of Findings for Suicide Prevention Training Programs

The findings presented in this study inform the design and curriculum of future suicide prevention training programs targeted at frontline supervisors in the Marine Corps. First, while Marine NCOs appear to make many observations about distressed Marines, they appear to heavily rely on the chain of command to manage a distressed Marine. Therefore, methods to bolster awareness of the availability of mental health care and other referral resources (e.g., military one source, Marine and Family Services) should be considered as they appear to be largely under-utilized. Additionally, given that female sex and higher education partially predict a greater knowledge of but less accepting opinions of suicide, these factors should be taken into consideration when selecting trainers to deliver the current prevention training. Training programs may also be designed to more closely match the educational level of the participant. Finally, the identification of organizational barriers being perceived strongest by the ground component suggests that a greater emphasis should be placed on informing ground forces of how to get treatment for mental health concerns.

Limitations and Strengths

There are a number of limitations associated with this study. First, the data used for this study's analyses is cross-sectional; therefore it only shows opinions in Marine NCOs prior to receiving the mandated suicide prevention training. Second, this data was collected as part of a program evaluation study; the original study had not been designed

to directly answer the questions posed in this thesis. Additionally, only 3% of Marine NCOs were surveyed, which may limit the generalizability of these findings. Also, the multiple numbers of comparisons conducted in this study increases the possibility of making a Type I error (false positive), interpretation of all findings exceeding an alpha of .01 should be done with caution. Finally, all data collected was self-report.

There are also several key strengths to this study such as its addition to a limited body of research looking at military occupation and suicide prevention trainings. Additionally, the large sample size allowed for multiple analyses including additional factor analyses on the SOQ and PBTC measures. Finally, several of these findings can serve to inform future training programs of Marines whom may potentially aid in limiting future suicides.

RESEARCH, TRAINING, AND POLICY RECOMMENDATIONS

Future research should consider sampling Marines from the enlisted and officer pay grades across all communities, including clinician administered assessments, and including qualitative assessments to identify other potential barriers to mental health care. Research is also warranted to evaluate potential interactions between suicide opinions, perceived barriers to care, and willingness to intervene. Finally, future research is recommended to evaluate the effectiveness of suicide prevention training programs in modifying attitudes towards suicide and perceptions of barriers to care for mental health.

Implications for training can also be drawn from these findings. Specifically, results suggest that each Marine component may have different needs to be addressed during prevention training (i.e., organization/cultural barriers in ground units); adjusting training to target these cultural differences may produce more favorable outcomes.

Furthermore, findings suggest prior exposure to suicide is related to more accepting views of suicide. Given that prior experience may also increase the credibility of a presenter (20), using these Marine NCOs as trainers in the NLMB program may produce more desirable outcomes.

The findings presented here also provide support for a move towards more tailored, community and Marine specific training as opposed to the current one-size-fits-all approach. Finally, the reported under-utilization of available resources for distressed Marines suggests a need to make available resources more accessible, potentially addressed through providing lists of resources to NCOs.

Table 1. Comparisons of Demographic Characteristics of Retained (N = 1758) versus Deleted Cases (N = 214) of Marine NCO Respondents

Characteristics	Retained Sample (N = 1758)		Deleted Cases (N = 214)	
	N	%	N	%
Component				
Logistics	906	51.5	118	55.1
Air	401	22.8	50	23.4
Ground	451	25.7	46	21.5
Gender				
Male	1618	92.0	198	92.5
Female	140	8.0	16	7.5
Ethnicity				
Caucasian	1054	60.0	108	50.5
African-American	145	8.2	24	11.2
Hispanic	337	19.2	39	18.2
Asian/American Indian/Pacific Islander	83	4.7	25	11.6
Other	139	7.9	18	8.5
Marital Status				
Married	889	50.6	95	44.4
Divorced/Separated/Widowed	188	10.7	23	10.7
Never Married	681	38.7	96	44.9
Education				
No High School Diploma	7	.4	2	1.0
High School Diploma or Equivalent	708	40.3	73	34.1
Some College, no degree	840	47.7	117	54.7
Associate degree	124	7.1	11	5.1
Bachelor's degree or higher	79	4.5	11	5.1
Rank				
E4	871	49.5	98	45.8
E5	887	50.5	116	54.2

Table 2. Demographic, Occupational, and Educational Characteristics of the Marine NCO Respondents (N = 1758) – USMC Total (18)

Characteristics	*Marine NCO Respondents (N = 1758)*		USMC Total %
	N	%	
Demographic			
Component			
Logistics	906	51.5	
Air	401	22.8	
Ground	451	25.7	
Gender			
Male	1618	92.0	92.9
Female	140	8.0	7.1
Ethnicity			
Caucasian	1054	60.0	69.0
African-American	145	8.2	10.0
Hispanic	337	19.2	17.0
Asian/American Indian/Pacific Islander	83	4.7	
Other	139	7.9	4.0
Marital Status			
Married	889	50.6	60.0*
Divorced/Separated/Widowed	188	10.7	
Never Married	681	38.7	
Education			
No High School Diploma	7	.4	6.0
High School Diploma or Equivalent	708	40.3	90.0
Some College, no degree	840	47.7	2.0
Associate degree	124	7.1	N/A
Bachelor's degree or higher	79	4.5	2.0
Rank			
E4	871	49.5	
E5	887	50.5	

* In Marine NCO's

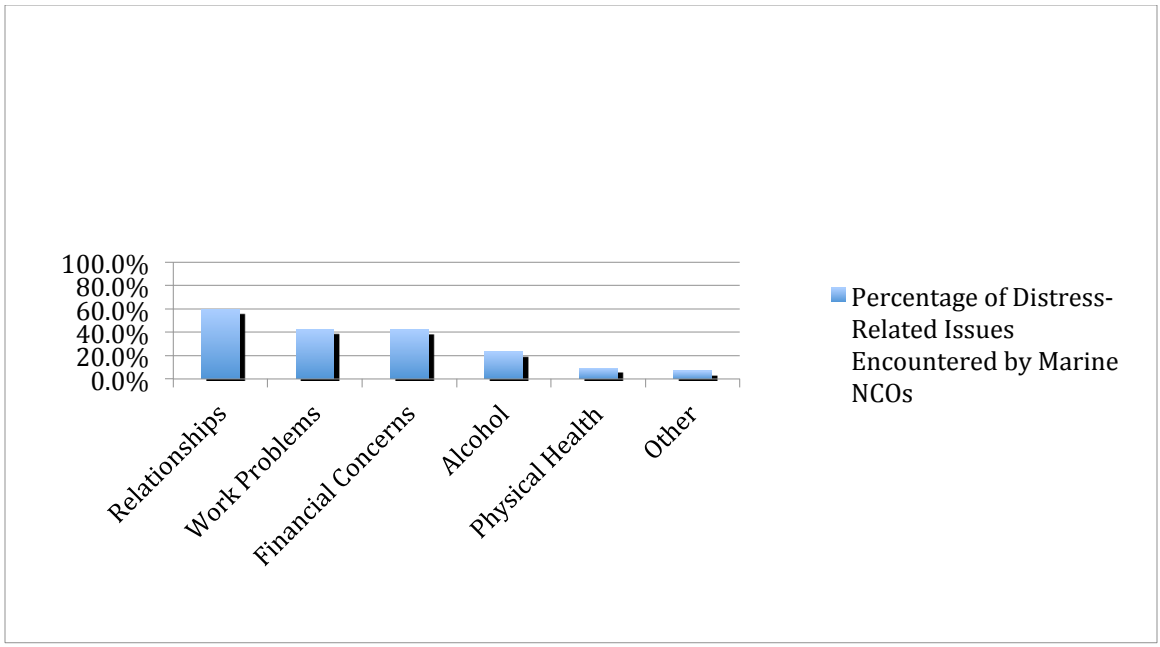

Figure 1. Percentage of Distress-Related Issues Encountered by Marine NCOs

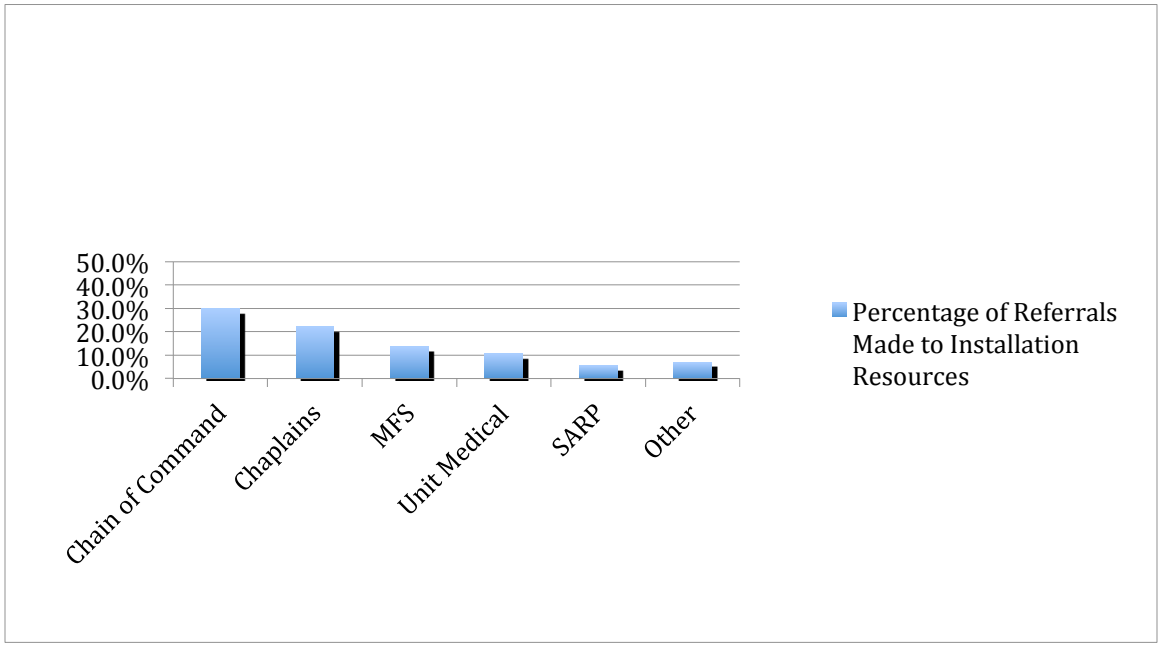

Figure 2. Percentage of Referrals Made to Installation Resources Used as Referral Source for Distressed Marines during the Past Month

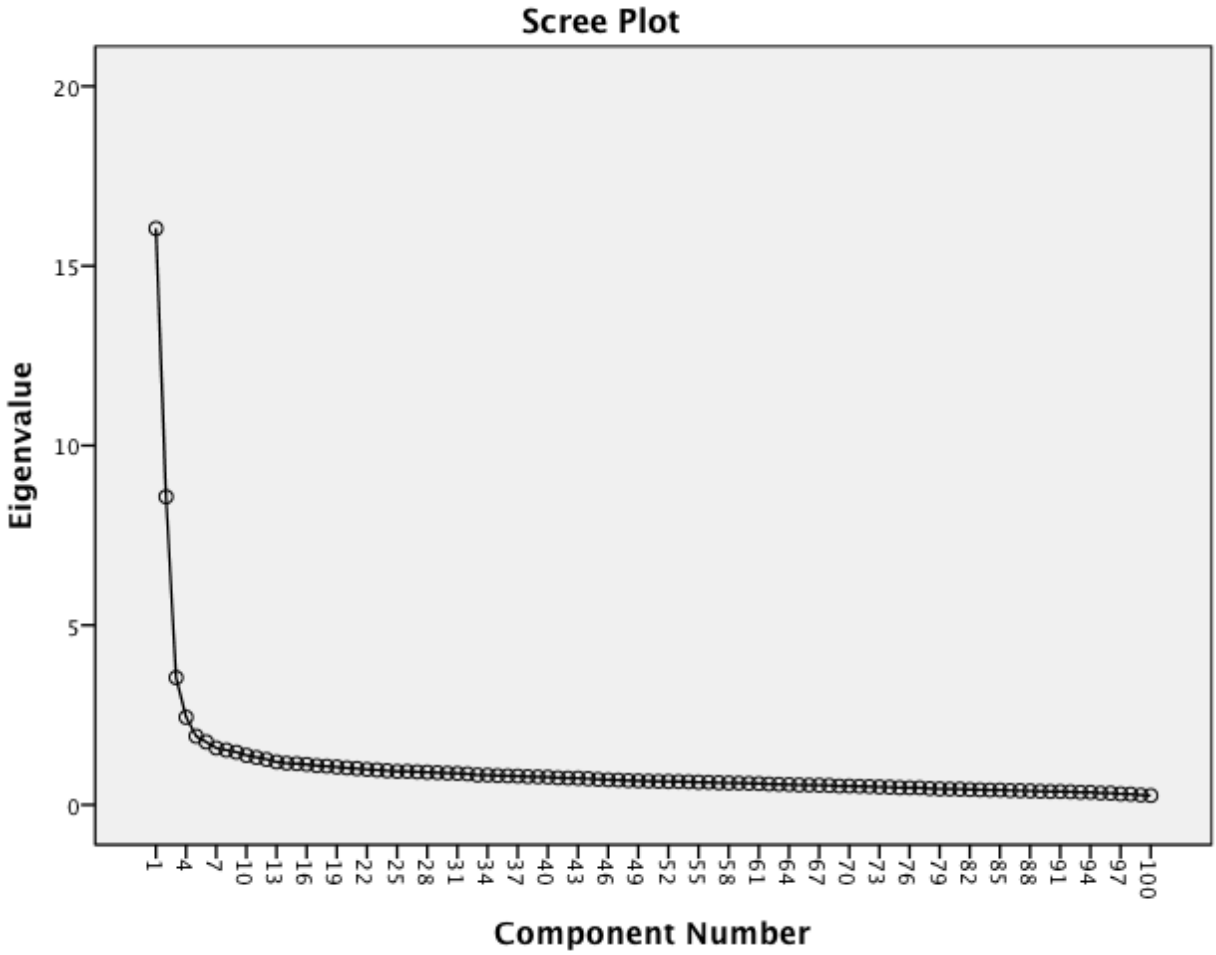

Figure 3: Scree plot for SOQ PCA

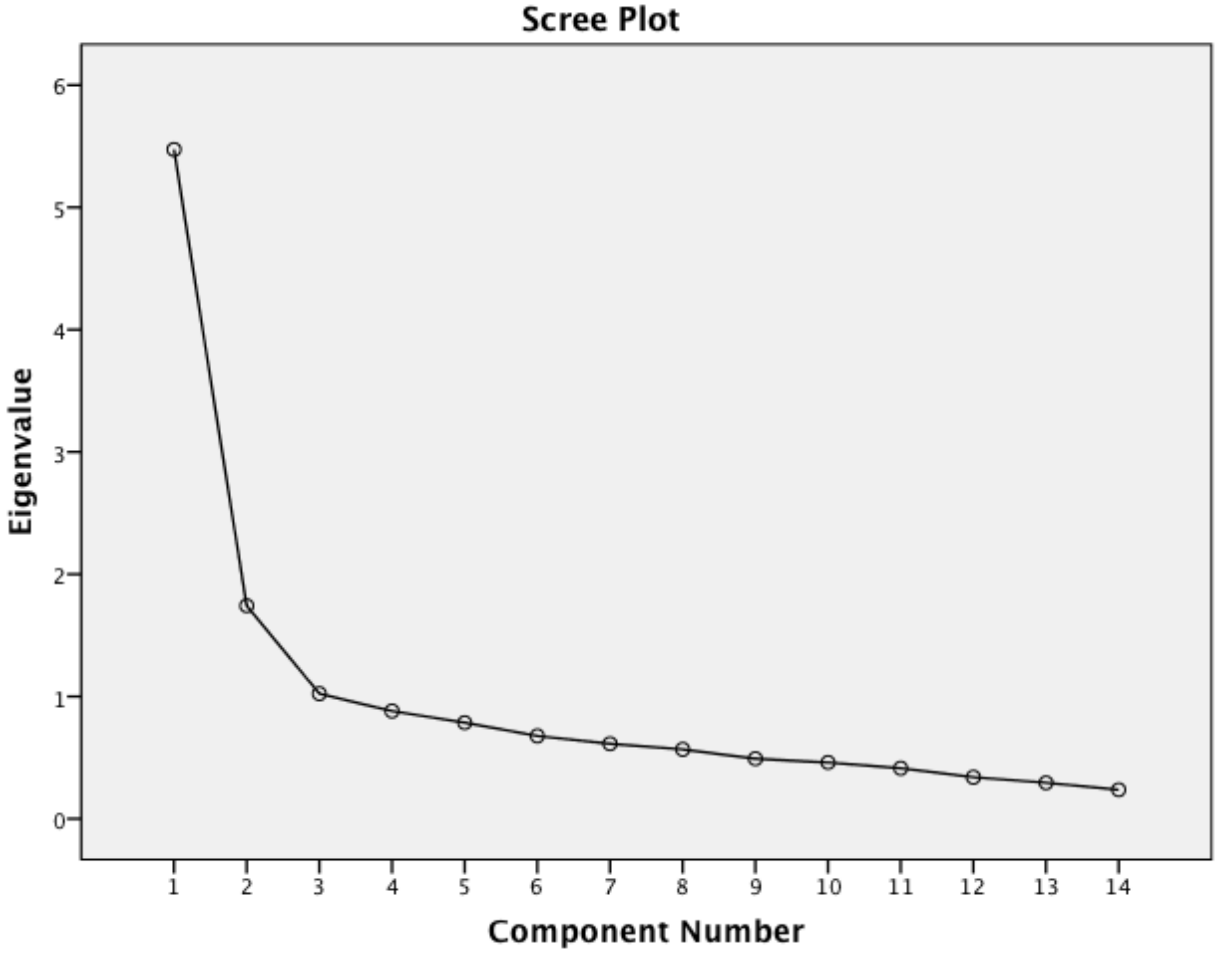

Figure 4: Scree plot for PBTC PCA

Table 3. Factor Loadings based on Principal Components Analysis with VARIMAX Rotation for the SOQ (items <.40 not shown)

Table 3a. Erroneous Assumptions about Suicide, 32 Items (α = .93)

Item Number	Item	Factor Loading
60	Many victims of fatal automobile accidents are actually unconsciously motivated to commit suicide.	.70
53	People who engage in dangerous sports like automobile racing probably have an unconscious wish to die.	.68
48	Once a person is suicidal, he is suicidal forever.	.67
52	Improvement following a suicidal crisis indicates that the risk is over.	.65
34	Most suicide victims are older persons with little to live for.	.65
56	Once a person survives a suicide attempt, the probability of his trying again is minimal.	.63
59	Suicide is normal behavior.	.62
86	Suicide occurs only in civilized societies.	.62
35	A person who tried to commit suicide is not really responsible for those actions.	.62
84	Passive suicide, such as an overdose of sleeping pills, is more acceptable than violent suicide such as by gunshot.	.60
44	The possibility of committing suicide is greater for older people (those 60 and over) than for younger people (20 to 30).	.60
87	People who die by suicide should not be buried in the same cemetery as those who die naturally.	.58
88	Most people who commit suicide do not believe in God.	.58
67	Sometimes suicide is the only escape from life's problems.	.56
54	Prisoners in jail who attempt suicide are simply trying to get better living conditions.	.54
46	In times of war, for a captured soldier to commit suicide is an act of heroism.	.54

49	There may be situations where the only reasonable resolution is suicide.	.54
70	If someone wants to commit suicide, it is their business and we should not interfere.	.52
51	The suicide rate is higher for minority groups such as Chicano, American Indians, and Puerto Ricans than for Whites.	.52
47	Suicide attempters are typically trying to get even with someone.	.52
89	Children from larger families (i.e., three or more children) are less likely to commit suicide as adults than single or only children.	.51
45	Most people who commit suicide do not believe in an afterlife.	.51
16	Individuals who kill themselves out of patriotism do so, not because they are courageous, but because they enjoy taking major risks.	.50
37	It's rare for someone who is thinking about suicide to be dissuaded by a "friendly ear".	.49
26	The suicide rate among physicians is substantially greater than for other occupational groups.	.46
17	Suicide is a leading cause of death in the U.S.	.46
93	People who attempt suicide are, as a group, less religious.	.43
11	Many suicides are the result of the desire of the victim to "get even" with someone.	.41
41	A large percentage of suicide victims come from broken homes.	.41
90	Suicide attempters are, as individuals, more rigid and less flexible than non-attempters.	.41
91	The large majority of suicide attempts result in death.	.41
6	Most suicides are triggered by arguments with a spouse.	.40

Table 3b. Emotional Perturbation 2, 16 Items (α = .83)

Item Number	Item	Factor Loading
77	Suicide attempts are typically preceded by feelings that life is no longer worth living.	.64
98	Individuals who are depressed are more likely to commit suicide.	.59
74	The most frequent message in suicide notes is of loneliness.	.58
65	External factors, like lack of money, are a major reason for suicide.	.58
76	Long term self-destructive behaviors, such as alcoholism, may represent unconscious suicide attempts.	.53
71	A suicide attempt is essentially a "cry for help".	.51
42	A rather frequent message in suicide notes is one of unreturned love.	.50
58	People who attempt suicide and live should be required to undertake therapy to understand their inner motivation.	.49
30	Over the past ten years the suicide rate in this country has increased greatly.	.48
73	Heroic suicides (e.g. the soldier in war throwing himself on a live grenade) should be viewed differently from other suicides (e.g. jumping off a bridge).	.47
85	Potentially, every one of us can be a suicide victim.	.47
36	About 75% of those who successfully commit suicide have attempted suicide at least once before.	.46
24	John Doe, age 45, has just committed suicide. An investigation will probably reveal that he has considered suicide for quite a few years.	.41
39	The method used in a given suicide probably reflects whether the action was impulsive or carefully and rationally planned.	.41
50	People should be prevented from committing suicide since most are not acting rationally at the time.	.41
64	A person whose parent has committed suicide is a greater risk for suicide.	.40

Table 3c. Acceptability 2, 8 Items (α = .54)

Item Number	Item	Factor Loading
13	People with incurable diseases should be allowed to commit suicide in a dignified manner.	.68
18	Suicide is an acceptable means to end an incurable illness.	.67
92	Some people are better off dead.	.60
25	Suicide is acceptable for aged and infirm persons.	.59
95	People do not have the right to take their own lives.	-.51
79	We should have "suicide clinics" where people who want to die could do so in a painless and private manner.	.48
57	In general, suicide is an evil act no to be condoned.	-.46
78	Suicide goes against the laws of God and/or nature.	-.41

Table 3d. Stigma Associated with Suicide 2, 6 Items (α = .68)

Item Number	Item	Factor Loading
97	Those who commit suicide are cowards who cannot face life's challenges.	.63
80	Those people who attempt suicide are usually trying to get sympathy from others.	.51
81	People who commit suicide lack solid religious convictions.	.49
38	People who commit suicide must have a weak personality structure.	.46
63	Suicide attempters who use public places (such as a bridge or tall building) are more interested in getting attention.	.44
83	People who bungle suicide attempts really did not intend to die in the first place.	.41

Table 4. Factor Loadings based on principle components analysis with VARIMAX rotation for the PBTC measure (items <.40 not shown)

Table 4a. Perceived Unit Stigma and Harm to Career, 7 Items (α = .88)

Item Number	Item	Factor Loading
9	Members of the Marine's unit might have less confidence in him/her.	.86
10	The Marine's unit leadership might treat him/her differently.	.85
12	The Marine would be seen as weak.	.82
8	It would harm a Marine's career.	.69
7	It would be embarrassing for a Marine.	.67
11	The Marine's leaders would blame him/her for the problem.	.62
14	A Marine would lose a security clearance.	.56

Table 4b. Organizational/Cultural Barriers 4 Items (α = .75)

Item Number	Item	Factor Loading
5	There would be difficulty getting time off work for treatment for a Marine.	.75
6	Mental health care costs too much money for a Marine.	.75
4	It is difficult to schedule an appointment for a Marine.	.71
13	Mental health care doesn't work for a Marine.	.53

Table 4c. Individual Barriers to Care, 3 Items (α = .53)

Item Number	Item	Factor Loading
2	Marines don't know where to get help.	.82
3	Marines don't have adequate transportation.	.59
1	Marines don't trust mental health professionals.	.56

Table 5a. Multiple Regressions on 4 EFA Factors, Significant Findings

Multiple Regressions on EFA Factors

	B	SE B	β
Erroneous Assumptions about Suicide			
Sex	.07	.04	.04
Education	.07	.02	.11***
Exposure	-.01	.03	-.01

Notes: $R^2 = .01$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Emotional Perturbation 2			
Sex	-.13	.04	-.08**
Education	-.08	.01	-.15***
Exposure	-.04	.02	-.04

Notes: $R^2 = .03$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Acceptability 2			
Sex	.13	.05	.07**
Education	.01	.02	.02
Exposure	-.04	.03	-.04

Notes: $R^2 = .01$, $p < .05$. * $p < .05$, ** $p < .01$, *** $p < .001$

Stigma Associated with Suicide			
Sex	.13	.05	.06**
Education	.06	.02	.08**
Exposure	.02	.03	.02

Notes: $R^2 = .01$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5b. Multiple Regressions on 5 Factor Model, Significant Findings

Multiple Regressions on 5 Factor Model

	B	SE B	β
Acceptability			
Sex	.14	.06	.05*†
Education	.05	.02	.06*
Exposure	-.06	.04	-.04

Notes: R^2 = .01, p < .01. * p < .05, ** p < .01, *** p < .001, † No longer significant in sensitivity analyses

Perceived Factual Knowledge			
Sex	.08	.04	.05*
Education	.07	.01	.12***
Exposure	.00	.02	.00

Notes: R^2 = .02, p < .001. * p < .05, ** p < .01, *** p < .001

Social Disintegration

Notes: R^2 = .00, p = .07. Model not significant.

Personal Defect

Sex	.13	.04	.08**
Education	.06	.01	.10***
Exposure	.00	.02	.00

Notes: $R^2 = .02$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Emotional Perturbation			
Sex	-.08	.04	-.05*
Education	-.04	.01	-.08**
Exposure	-.05	.02	-.05*

Notes: $R^2 = .01$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5c. Multiple Regressions on 8 Clinical Scales, Significant Findings

Multiple Regressions on 8 Clinical Scales

	B	SE B	β
Suicide Reflects Mental Illness			
Notes: $R^2 = .00$, $p = .98$. Model not significant.			
Cry For Help			
Sex	.03	.04	.02
Education	.04	.01	.07**
Exposure	-.01	.02	-.01
Notes: $R^2 = .01$, $p < .05$. * $p < .05$, ** $p < .01$, *** $p < .001$			
Right to Die			
Sex	.12	.05	.06*
Education	.01	.02	.02
Exposure	-.04	.03	-.04
Notes: $R^2 = .01$, $p < .05$. * $p < .05$, ** $p < .01$, *** $p < .001$			
Importance of Religion			
Notes: $R^2 = .00$, $p = .40$. Model not significant.			
Impulsivity			

Notes: $R^2 = .00$, $p = .11$. Model not significant.

Suicide is Normal

Notes: $R^2 = .00$, $p = .11$. Model not significant.

Suicide Reflects Aggression/Anger

Notes: $R^2 = .00$, $p = .30$. Model not significant.

Suicide is Morally Bad

Sex	.22	.05	.10***
Education	.00	.02	.00
Exposure	-.02	.03	0.02

Notes: $R^2 = .01$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6. Multiple Regressions on Barriers to Care, Significant Findings

Multiple Regressions on Barriers to Care

	B	SE B	β
Total Score			
Sex	-.96	.78	-.03
Education	-.75	.26	-.07**
Exposure	-2.42	.45	-.13***

Notes: $R^2 = .02$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$, † No longer significant in sensitivity analyses

Perceived Unit Stigma and Harm to Career			
Sex	-.06	.08	-.02
Education	-.08	.03	.06**
Exposure	-.24	.05	-.12***

Notes: $R^2 = .02$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Organizational/Cultural Barriers to Care			
Sex	-.04	.07	-.01
Education	-.05	.02	-.06*
Exposure	-.13	.04	-.08**

Notes: $R^2 = .01$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$.

Individual Barriers to Care			
Sex	-.14	.06	-.05*
Education	-.03	.02	-.03
Exposure	-.16	.04	-.11***

Notes: $R^2 = .02$, $p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7a. Aim 5 MANOVA: USMC Components on PCA Model of SOQ

Factor Name	Logistics (n = 906)		Air (n = 401)		Ground (n = 451)		Results (N = 1758)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*
EAS	3.41	.52	3.41	.49	3.38	.48	.49	.61
EP2	2.56_a	.45	2.63_b	.45	2.60	.42	3.20	.04
AC2	3.14	.51	3.12	.51	3.13	.51	.45	.64
SAS	2.93	.56	2.94	.54	2.98	.56	1.01	.36

Note: Significant differences identified through Tukey's HSD and identified by subscript.

Table 7b. Aim 5 MANOVA: USMC Components on 5 Factor Model, All ns.

Factor Name	Logistics (n = 906)		Air (n = 401)		Ground (n = 451)		Results (N = 1758)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*
Acceptability	3.51	.72	3.46	.65	3.49	.71	.67	.50
Perceived Factual Knowledge	3.26	.49	3.30	.48	3.26	.46	.68	.51
Social Disintegration	3.24	.51	3.21	.49	3.20	.47	1.04	.35
Personal Defect	3.07	.49	3.06	.43	3.08	.48	.32	.73
Emotional Perturbation	2.70	.46	2.74	.44	2.73	.43	1.23	.29

Table 7c. Aim 5 MANOVA: USMC Components on 8 Clinical Scale Model

Factor Name	Logistics (n = 906)		Air (n = 401)		Ground (n = 451)		Results (N = 1758)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*
Suicide Reflects Mental Illness	2.91	.43	2.93	.40	2.93	.39	.62	.54
Cry for Help	2.97	.41	3.01	.38	2.97	.38	1.73	.18
Right to Die	3.27	.56	3.22	.52	3.27	.54	1.34	.25
Importance of Religion	3.07	.55	3.06	.51	3.05	.51	.32	.73
Impulsivity	3.01_a	.45	3.07_b	.42	3.05	.41	3.12	.04
Suicide is Normal	3.23	.57	3.26	.53	3.25	.54	.69	.50
Suicide Reflects Aggression/Anger	3.00	.51	3.06	.47	3.04	.48	2.36	.09
Suicide is Morally Bad	3.04	.60	3.04	.54	2.99	.54	1.56	.21

Note: Significant differences identified through Tukey's HSD and identified by subscript.

Table 8. Aim 5 MANOVA: USMC Components on PCA Model of PBTC

Factor Name	Logistics (n = 906)		Air (n = 401)		Ground (n = 451)		Results (N = 1758)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*
Perceived Unit Stigma and Harm to Career	3.32	.94	3.42	.95	3.36	.94	1.46	.23
Organizational/Cultural Barriers	3.61_a	.80	3.64_a	.76	3.49_b	.78	5.09	.01
Knowledge of Available Treatment	3.12_a	.73	3.23_b	.65	3.16	.66	3.89*	.02

Note: Significant differences identified through Tukey's HSD and identified by subscript.* Brown-Forsyth reported for Knowledge of Available Treatment

Table 9. Supplementary Data for PBTC Measure

Item	Logistics (n = 906)		Air (n = 401)		Ground (n = 451)		Results (N = 1758)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*
Marines don't trust mental health professionals	2.68	.92	2.79	.87	2.66	.95	2.46	.09
Marines don't know where to get help	3.15	1.08	3.26	1.00	3.28	1.04	2.90	.06
Marines don't have adequate transportation	3.53	.97	3.65	.92	3.54	.91	2.38	.09
It is difficult to schedule an appointment for a Marine	3.38	1.09	3.43	1.04	3.34	1.05	.78	.46
There would be difficulty getting time off work for treatment for a Marine	3.51	1.17	3.51	1.15	3.29	1.10	6.52	.00
Mental health care costs too much money for a Marine	3.85	1.03	3.93	.97	3.60	1.15	11.96	.00
It would be embarrassing for a Marine	2.56	1.10	2.62	1.12	2.53	1.08	.81	.45
It would harm a Marine's career	3.15	1.12	3.36	1.07	3.14	1.13	5.60	.00

Members of the Marine's unit might have less confidence in him/her	2.60	1.03	2.66	1.05	2.64	1.05	.64	.53
The Marine's unit leadership might treat him/her differently	2.60	1.06	2.66	1.06	2.66	1.09	.70	.50
The Marine's leaders would blame him/her for the problem	3.30	1.03	3.34	.99	3.37	.96	.71	.49
The Marine would be seen as weak	2.85	1.11	2.92	1.08	2.85	1.13	.66	.52
Mental health care doesn't work for a Marine	3.69	.91	3.70	.84	3.71	.84	.11	.90
A Marine would lose his security clearance	2.91	.95	2.97	.95	2.96	.92	.76	.47

*Lower numbers indicate greater perceived barriers to care

APPENDIX: Pre-training questionnaire

INFORMATIONAL SHEET

"Never Leave a Marine Behind"

REQUEST FOR YOUR HELP: We are requesting your help with a program evaluation research study. The "Never Leave a Marine Behind" program emphasizes the role of "good leadership" and provides in-depth training to non-commissioned officers in assisting Marines in distress, who may be at risk for suicide behavior.

PURPOSE: To date, there is no existing information on the effectiveness of similar training programs in the United States military. Evaluating our efforts in training Marine non-commissioned officers such as yourself is a significant step in the Marine Corps' efforts to prevent suicides. We hope that by systematically evaluating the program's objectives in training NCOs as frontline interveners for distressed Marines, future improvements in maximizing the efficacy of such programs may occur.

VOLUNTARY AND CONFIDENTIAL: Your decision to complete or not complete the questionnaires will not affect your ability to participate in the training. Your responses to the questionnaire will be confidential. Your course instructor and your command will not know who has and who has not chosen to participate.

FOUR EASY STEPS:

STEP 1. Please complete the two pre-training questionnaires today which will take approximately 20-30 minutes of your time. We will then send you reminders so that you can complete additional questionnaires at your convenience via the web.
STEP 2. Because we plan to evaluate both the short- and long-term impact of training, the Marine Corp Suicide Prevention Program will contact you via email again in 7 days post training in order to request the completion of one web-based follow-up questionnaire which will take no more than 10 minutes of your time.
STEP 3. The Marine Corp Suicide Prevention Program will contact you again in 3-Months to request that you complete one follow-up web-based questionnaire which will take no more than 10 minutes of your time.
STEP 4. The Marine Corp Suicide Prevention Program will contact you again in 6 months to request that you complete two web-based questionnaires. The 6-Month questionnaires will take no more than 20-30 minutes of your time.

REMINDER: By completing the questionnaires today, you are not obligated to respond to any subsequent surveys in the future. However, we would very much appreciate your feedback following the training.

BENEFITS AND RISKS: There are no direct benefits to you and there is no financial compensation for your time. However, your responses will assist the Marine Corp in best addressing the needs of your fellow Marines who may be experiencing distress. There are no expected risks associated with participating in this research. You may experience some discomfort in answering questions pertaining to suicide. You can stop your participation at any time. Local and national referral sources are provided in case you would like to request assistance.

QUESTIONS?: If you have any further questions about our plans, please contact CDR Aaron D. Werbel, Ph.D., Suicide Prevention Program Manager, U.S. Marine Corps, 3280 Russell Road, Quantico, VA 22134-5103, 703-784-9542, e-mail: aaron.werbel@usmc.mil.

THANK YOU FOR YOUR VALUABLE FEEDBACK.

The answers to the following four questions are to generate a personal code to link future surveys to this initial questionnaire.

1. What is the name of the city where your mother was born? (If not known, indicate the following, "unknown.") .....
2. What is the name of the city where you were born? (If not known, indicate the following, "unknown.") .....
3. What was your drill instructor's last name? .....
4. What was your first pet's name? (If none, indicate "none.") .....

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5. Gender

- ☐ Male
- ☐ Female

6. Marital status

- ☐ Single
- ☐ Married
- ☐ Divorced
- ☐ Separated
- ☐ Widowed

7. Ethnicity

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or Pacific Islander
- ☐ White
- ☐ Other
- ☐ Mixed

8. Military rank

- ☐ E1
- ☐ E2
- ☐ E3
- ☐ E4
- ☐ E5
- ☐ E6

9. Military Occupation Specialty (MOS)

☐☐☐☐ (Please enter 4-digit code)

- ☐ Corpsman
- ☐ Religious Program Specialist

10. Major Subordinate Command

- ☐ 1st MARDIV
- ☐ 2nd MARDIV
- ☐ 3rd MARDIV
- ☐ 4th MARDIV
- ☐ 1st MAW
- ☐ 2nd MAW
- ☐ 3rd MAW
- ☐ 4th MAW
- ☐ 1st MLG
- ☐ 2nd MLG
- ☐ 3rd MLG
- ☐ Other (please specify)

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11. Education Level

- ☐ Less than 9th grade
- ☐ 9th to 12th grade, no diploma
- ☐ High school graduate or equivalent
- ☐ Some college, no degree
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Graduate or Professional degree
- ☐ Technical training or certification (please specify below)
- ☐ Other (please specify below)

Technical training or certification

Other

12. Collateral Duties - Special Training (Please check all that apply):

- ☐ Undergraduate degree in psychology or related area
- ☐ Sexual Assault Response Coordinator (SARC)
- ☐ Uniformed Victim Advocate (UVA)
- ☐ Substance Abuse Control Officer (SACO)
- ☐ None
- ☐ Other (please specify)

13. If yes to question 12, how long have you worked within this area of special training?

Years ☐

Months ☐

14. How much interaction do you routinely have with *distressed* Marines?

- ☐ Very frequent interaction
- ☐ Frequent interaction
- ☐ Occasional interaction
- ☐ Little interaction
- ☐ Very little interaction
- ☐ Never

15. In your current unit, have you ever encountered a Marine with suicidal thoughts? ☐ Yes ☐ No

16. In your current unit, have you encountered a Marine who attempted suicide? ☐ Yes ☐ No

17. In your current unit, have you encountered a Marine who died by suicide? ☐ Yes ☐ No

18. Outside your current unit, have you had any specific experiences with family, friends, or Marines who have either attempted suicide or died by suicide? ☐ Yes ☐ No

19. If yes to question 18, what is the relationship to you?

- ☐ Mother
- ☐ Wife
- ☐ Daughter
- ☐ Sister
- ☐ Niece
- ☐ Aunt
- ☐ Cousin
- ☐ Marine
- ☐ Father
- ☐ Husband
- ☐ Son
- ☐ Brother
- ☐ Nephew
- ☐ Uncle
- ☐ Friend
- ☐ Other (please specify relationship in the box below)

20. For the following statements, please select the best response which describes your perspective.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
It is important that as leaders, we know about our Marines' personal lives.	☐	☐	☐	☐	☐
It is important that as leaders, we develop a sense of trust with our Marines.	☐	☐	☐	☐	☐
A Marine who seeks help for mental health concerns including suicidal thoughts will jeopardize his/her military career.	☐	☐	☐	☐	☐
I have an understanding of what causes some Marines to attempt suicide.	☐	☐	☐	☐	☐
NCO leaders play an essential role in preventing suicide.	☐	☐	☐	☐	☐
I can identify the signs of distress in the Marines I lead.	☐	☐	☐	☐	☐
I am likely to intervene personally upon observing a *distressed* Marine.	☐	☐	☐	☐	☐
I am confident that if one of my Marines is displaying sudden changes in behavior, physical appearance, or emotions, I can see this as a potential sign of distress.	☐	☐	☐	☐	☐
I feel comfortable talking to a *distressed* Marine about life stressors related to one's relationships, work problems, and finances, for instance.	☐	☐	☐	☐	☐
If I ask a Marine in distress - "Are you thinking of killing yourself?" - Then, I may make the situation worse.	☐	☐	☐	☐	☐
If I notice that a Marine is *distressed* or thinking about suicide, I will intervene.	☐	☐	☐	☐	☐
If I notice that a Marine is *distressed* or thinking about suicide, I will provide referrals to available helping resources.	☐	☐	☐	☐	☐
I am aware and have quick access to a listing of available resources at my installation that could be used in case of a suicidal crisis.	☐	☐	☐	☐	☐

21. Which of the following are important actions to take if a Marine discloses thoughts of killing him or herself? (Check all that apply)

- ☐ Remove means of self-harm, even if you have to do it forcibly
- ☐ Encourage the Marine to talk about feelings
- ☐ Don't leave the Marine alone for any reason
- ☐ Take the Marine to the chaplain and/or a mental health professional
- ☐ Tell the Marine why suicide is the wrong idea

22. The concerns listed below might affect a Marine's decision to receive mental health counseling or other types of helping services. To what extent do you agree with each statement?

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Marines don't trust mental health professionals.	☐	☐	☐	☐	☐
Marines don't know where to get help.	☐	☐	☐	☐	☐
Marines don't have adequate transportation.	☐	☐	☐	☐	☐
It is difficult to schedule an appointment for a Marine.	☐	☐	☐	☐	☐
There would be difficulty getting time off work for treatment for a Marine.	☐	☐	☐	☐	☐
Mental health care costs too much money for a Marine.	☐	☐	☐	☐	☐
It would be embarrassing for a Marine.	☐	☐	☐	☐	☐
It would harm a Marine's career.	☐	☐	☐	☐	☐
Members of the Marine's unit might have less confidence in him/her.	☐	☐	☐	☐	☐
The Marine's unit leadership might treat him/her differently.	☐	☐	☐	☐	☐
The Marine's leaders would blame him/her for the problem.	☐	☐	☐	☐	☐
The Marine would be seen as weak.	☐	☐	☐	☐	☐
Mental health care doesn't work for a Marine.	☐	☐	☐	☐	☐
A Marine would lose a security clearance.	☐	☐	☐	☐	☐

23. In the past month, how many Marines have you **noticed** as distressed?

☐ 0 ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ Greater than 9

24. In the past month, how many *distressed Marines* have you **engaged** in a conversation about their distress?

☐ 0 ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ Greater than 9

25. In the past month, how many *distressed Marines* have you **asked** about suicide?

☐ 0 ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ Greater than 9

26. In the past month, how many *distressed Marines* have you **referred** for help?

☐ 0 ☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ Greater than 9

27. Which of the following installation resources have you used as a referral source for a distressed Marine during the past month? (Check all that apply)

- ☐ Chain of Command
- ☐ Marine and Family Services
- ☐ Chaplains
- ☐ Unit Medical (BAS, RAS, GAS, etc.)
- ☐ Substance Abuse Rehabilitation Programs (SARP)
- ☐ Other (please specify)

28. Please indicate the number of referrals you have provided during the past month to each of the following:

Chain of Command.....	
Marine and Family Services...	
Chaplains.....	
Unit Medical (BAS, RAS, GAS, etc.)	
Substance Abuse Rehabilitation Programs (SARP).....	
Other	

29. What distress-related issues do you encounter most frequently? (Check all that apply)

- ☐ Relationships
- ☐ Work Problems
- ☐ Financial Concerns
- ☐ Alcohol
- ☐ Physical Health
- ☐ Other (please specify)

30. What signs of distress do you look for among your Marines?

31. What are the most common resources you use to assist those Marines in distress?

32. What is the single most important strategy for an NCO to prevent suicide?

Thank you for completing this questionnaire.

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