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Prevalence of High Emotional Distress and Symptoms of Post-Traumatic Stress Disorder in U.S. Air Force Active Duty Remotely Piloted Aircraft Operators
(2010 USAFSAM Survey Results)

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14. ABSTRACT

The demand for United States Air Force (USAF) remotely piloted aircraft (RPA) intelligence, surveillance, reconnaissance (ISR) and weapons-strike operations has led to the necessity of sustaining around-the-clock operations across the globe. Because of the unique nature of RPA operations, there is a wide range of opinions among military and medical leadership as to the sources, levels, and impact of stress affecting performance capabilities among RPA operators (pilots, sensor operators, and mission intelligence coordinators). The purpose of this study is to (a) identify main sources of self-reported occupational stress, (b) use standardized self-report questionnaires to identify rates of clinical distress and post-traumatic stress disorder (PTSD), (c) compare findings with local non-RPA operator airmen (logistics and support units from the same geographic locations), and (d) identify demographic and occupational stressors that correlate with (or are predictive of) clinical distress and PTSD among Predator/Reaper operators. Participants included 670 USAF RPA Predator/Reaper operators and 751 noncombatant airmen. Each participant completed a demographics questionnaire, items assessing their top sources of occupational stress, and standardized instruments assessing emotional distress and PTSD. Participation was encouraged by line leadership, and responses to the survey were anonymous to maximize self-disclosure. The most commonly cited stressors among RPA operators included long hours, shift work, deployed in-garrison status, ergonomic design of the ground control station, and sustaining vigilance to large amounts of real-time visual and auditory data. Combat-related stressors were not rated as top sources of stress. Rates of clinical distress and PTSD were higher among RPA operators (20% and 5%, respectively) in comparison to non-RPA airmen (11% and 2%, respectively). Given the challenging nature of sustaining around-the-clock missions, the results of this study suggest RPA operators should have regular access to mental health care. Military leadership recommendations were developed from study results to optimize performance and occupational climate for USAF ISR weapons-deploying RPA platforms.

15. SUBJECT TERMS
Remotely piloted aircraft operators, PTSD, ISR, clinical distress, occupational stressors

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1.0 EXECUTIVE SUMMARY

The demand for United States Air Force (USAF) remotely piloted aircraft (RPA) intelligence, surveillance, reconnaissance and weapons-strike operations has led to the necessity of sustaining around-the-clock operations in support of critical missions on the battlefield and around the globe. Because of the novel and unique nature of weapons-bearing RPA operations, there is a wide range of opinions among military and medical leadership as to the sources, levels, and impact of stress among RPA operators (pilots, sensor operators, and mission intelligence coordinators) affecting performance capabilities. The purpose of this study is to (a) identify the main sources of self-reported occupational stress among such operators, (b) use standardized self-report questionnaires to identify rates of clinical distress and post-traumatic stress disorder (PTSD), (c) compare findings with local non-RPA operator airmen (logistics and support units from the same geographic locations), and (d) identify demographic and occupational stressors that correlate with (or are predictive of) clinical distress and PTSD among Predator/Reaper operators.

A total of 670 USAF RPA Predator/Reaper operators from Air Combat Command), Air Force Special Operations Command, and Air National Guard units conducting around-the-clock operations over foreign battlefields and areas of national interest participated in the study. A total of 751 non-RPA airmen from support/logistic units supporting RPA operations also participated in the study. Each participant was given a survey composed of a set of instructions, a demographics questionnaire, a series of questions asking participants to describe their top sources of occupational stress, and standardized instruments to evaluate symptoms and severity of emotional distress and PTSD. Participants were encouraged by military leadership to participate in the survey, and their responses to questionnaires were anonymous to maximize self-disclosure.

The results of the study revealed the most commonly cited stressors among RPA operators included long hours, shift work, deployed in-garrison status, ergonomic design of the ground control station, and sustaining vigilance to large amounts of real-time visual and auditory data. Combat-related stressors were not rated as top sources of stress among participants. Rates of clinical distress and PTSD were higher among RPA operators (20% and 5%, respectively) in comparison to non-RPA airmen (11% and 2%, respectively). A series of logistic regression and odds ratio procedures was performed to assess demographic and occupational variables correlated with (and predictive of) high emotional distress and PTSD.

Given the challenging nature of sustaining around-the-clock asymmetrical warfare, efforts should be made to ensure RPA operators have regular access to health care. Military line and medical leadership recommendations were developed from study results in an effort to optimize performance and the occupational climate for USAF intelligence, surveillance, reconnaissance weapons-deploying RPA platforms.

2.0 INTRODUCTION

Among the variety of United States Air Force (USAF) remotely piloted aircraft (RPA), the MQ-1 Predator and MQ-9 Reaper have emerged as significant weapons-bearing aircraft in support of aerial intelligence, surveillance, reconnaissance (ISR) and close air support weapons-bearing operations around the globe. Such aircraft have served multiple roles in support of providing critical real-time visual and streaming data and images to military commanders for

identifying fixed and moving targets, tracking enemy movements and assets, locating and destroying weapons caches, directing and protecting ground forces, safeguarding convoys, tracking and/or eliminating enemy combatants, augmenting manned-strike missions, and surveying post-strike battle damage. Due to advances in aerial, satellite, and computer-based technology, USAF RPA Predator/Reaper operators can provide real-time engagement to military operations while stationed within the nation's protective borders.

Although most USAF Predator/Reaper operators do not have to deploy to combat zones, it would be incorrect to conclude they do not face demanding occupational stressors (operational and combat related). The increasing demand for USAF RPA ISR and weapons-strike operations has reportedly led to a significant increase in operational hours, shift work, and combat-related stressors (e.g., streaming data of destruction of enemy assets and hunter/killer role). As a result, there is concern about the emotional well-being of such operators. Anecdotal discussions the authors of this study have had with aeromedical and command leadership reveal a wide range of opinions regarding the sources, levels, and impact of occupational stress. Although such operators are shielded from the traditional threats to physical safety, there is minimal empirical research on the impact of the high operational tempo, rotating shift work schedules, daily deployed in-garrison status requiring operators to continuously balance warfighter roles with domestic/personal lives, and the constant (albeit indirect) exposure to combat operations that may elevate the risk for clinical distress and post-traumatic stress disorder (PTSD).

Operational stressors are defined as those related to sustaining day-to-day operations. These include issues such as available manpower, equipment, general resources, and requirements needed to perform occupational tasks and objectives. Although research specific to the RPA working environment is limited, various studies over the past 5 years have revealed USAF RPA personnel may be at risk of significant emotional fatigue (1-3). Recently, Chappelle, Salinas, & McDonald (4) identified several occupational stressors relevant to RPA operators. Such stressors include, but are not limited to, long hours (e.g., 6 days on, 2 days off), frequent shift work and shift changes (e.g., rotating shift changes every 30 to 90 days), restricted working environment (i.e., small ground stations with limited freedom for mobility or ability to spontaneously get up and move), and work station ergonomics (e.g., uncomfortable seating and inadequate climate control). Such operational stressors have been associated with negative changes in emotional health (5-8) and diminished job performance (9,10) in a variety of civilian and military settings.

Combat stressors are defined as those that involve ISR and weapons-deployment missions in direct support of combat operations. Current technology allows RPA operators to directly observe and interact with ground troops or enemy combatants in "real-time." According to Chappelle, Salinas, & McDonald (4), combat-related stressors relevant to RPA operations include, but are not limited to, targeting and destroying enemy combatants and assets, observing live video feed and images of destruction to ensure combatants have been destroyed or neutralized, making decisions regarding the identification of enemy combatants, and observing a group or single enemy combatant for several days or weeks. Secondary effects of their missions can be identification with enemy combatants due to observing their personal interactions with family members, which may increase the internal conflict over deploying weapons, and guilt/remorse when mistakes result in friendly force and/or civilian bystander casualties.

It is widely accepted that exposure to combat heightens the risk for emotional problems (e.g., depression, anxiety, PTSD), as well as behavioral problems (e.g., increased alcohol and substance use) in military personnel who have been deployed (11-16). Furthermore, Maguen

and colleagues (17), in their study of over 2,700 U.S. Army service members, found that even after controlling for combat exposure, "killing" and "being responsible for killing" were associated with higher levels of post-traumatic stress symptoms and other emotional-behavioral problems. Although Predator/Reaper operators are not engaged in hand-to-hand combat, they are often involved in operations where they witness and make decisions that lead to the destruction of enemy combatants and assets. It stands to reason among line and medical leadership that repeated vicarious exposure and responsibility for deploying weapons in support of combat operations may place RPA operators at elevated risk for emotional distress and/or PTSD.

Emotional distress is a commonly used term to refer to an unpleasant emotional state characterized by negative emotional (e.g., increasing feelings of anger, irritability, agitation, hopelessness, nervousness, sadness), behavioral (e.g., increasing arguments with others, trouble getting along with peers), physical (e.g., difficulty sleeping, fatigue, sensations of heart pounding, general muscle tension, headaches), and cognitive (e.g., difficulty concentrating, sustaining attention) changes in functioning. Given the sensitive, high-demand, high-precision nature of USAF ISR operations, it is critical to military commanders to gauge the levels of emotional distress experienced among airmen directly engaged in such operations. If a significant number of RPA operators are found to be experiencing high levels of distress, then commanders and medical providers may realize a need for intervention to preserve both their performance and well-being.

PTSD is a significant psychological condition developed after exposure to a traumatic event (e.g., witness or experience events that lead to actual or threatened death, injury to others) in which the response involved intense feeling of fear, helplessness, or horror (18). The condition is characterized by a clustering of symptoms that fall into the categories of (a) a sense of re-experiencing the event (e.g., recurrent and intrusive recollections of the event, distressing dreams of the event, acting or feeling of the traumatic event were recurring, physiological re-activity to cues that resemble as aspect of the event), (b) persistent avoidance of stimuli associated with the event or numbing of general responsiveness (e.g., effort to avoid thought, feeling, or conversations associated with the event, avoidance of activities that arouse recollections of the event, feeling of detachment from others, restricted range of affect, sense of foreshortened future), as well as (c) increased arousal (e.g., difficulty falling or staying asleep, increase in irritability/outbursts of anger, difficulty concentrating, hyper-vigilance, exaggerated startle response). Two or three symptoms above may not be uncommon after exposure to combat operations. However, it is the clustering, severity, and persistence of such symptoms along with impaired social or occupational functioning that lead to the diagnosis of PTSD. Evaluating for PTSD among deployed military personnel supporting combat operations in theater is a standard practice. It is reasonable to consider the same precautions for assessing USAF ISR operators who are supporting ISR and weapons-strike operations in theater yet operate within the nation's borders.

Anecdotal evidence based upon conversations with USAF medical and line command leadership at active duty USAF installations indicates disparate opinions regarding the level of clinical distress and PTSD among RPA operators. The purpose of this study is to (1) establish, with known, commonly used instruments, rates of clinical distress and PTSD among RPA operators (pilots, sensor operators, mission coordinators); (2) compare those rates to other local non-RPA operator career fields (logistics and support units from the same geographic locations); and (3) identify any operational or combat stressors that may correlate with distress or PTSD.

The findings from this study will serve to inform USAF commanders and medical personnel of the levels of distress and PTSD of their RPA operators as well as identify factors that directly impact the mental health of their operators.

3.0 METHODS

3.1 Participants

In total, 1,421 USAF active duty airmen participated in the survey from USAF installations within the nation's borders between 2010 and 2011. Participants included 670 Predator/Reaper operators (pilots, sensor operators, and mission intelligence coordinators) from Air Combat Command, Air Force Special Operations Command, and Air National Guard units supporting around-the-clock operations across the globe. Participants also included 751 noncombatant airmen (i.e., airmen from support and logistics squadrons from USAF installations supporting RPA operations). See Table 1 for a breakdown of group demographics.

Table 1. Demographics Per Group

Demographic	RPA Operator (n=670)		Noncombatant Control (n=751)	
	Number	%	Number	%
Gender				
Male	533	80.40	651	86.92
Female	130	19.60	98	13.08
Age				
18-25	259	38.66	327	43.54
26-30	202	30.15	171	22.77
31-35	101	15.07	109	14.51
36-40	60	8.96	83	11.05
41+	48	7.16	61	8.12
Rank				
Enlisted	453	67.61	582	77.50
Officer	217	32.39	169	22.50
Marital Status				
Single	298	45.15	339	46.57
Married	262	54.85	389	53.43
Time on Station				
<24 mo	242	36.12	451	60.05
>24 mo	428	63.88	300	39.95
Shift Schedule				
Day Shift	379	56.57	524	69.77
Swing/Night Shift	291	43.43	22	30.23
Hours Worked Per Week				
<50	430	64.18	292	38.88
>50	240	35.82	459	61.12

The purpose and methodology of the study were reviewed and granted exemption from the Wright-Patterson Air Force Base Institutional Review Board and assigned protocol number F-WR-2009-0063-E. The voluntary and fully informed consent of participants was obtained in accordance with 32 CFR 219 and AFI 40-402.

3.2 Measures

Participants were given a demographic questionnaire to complete composed of several items that assessed their duty position, rank, gender, age range, marital status, number of children living at home, length of time serving in their duty position, average number of hours worked in a typical week, and current shift work. Participants were also asked to write in and describe their top three occupational stressors. The demographics questionnaire was developed to ensure anonymity for those completing the items. This was to support self-disclosure regarding stress levels in a community where there may be a strong stigma regarding the reporting of mental health problems.

3.2.1 Outcome Questionnaire-45 (OQ-45.2). The OQ-45.2 is a 45-item survey assessing symptoms of emotional distress over a 1-week period including difficulties in interpersonal relationships, social roles, and general quality of life (19). Each item has a Likert response rating from "*Almost Always*" to "*Never*." The responses are numerically coded on a scale of 0 to 4 based upon the direction of endorsement. The items are summed to yield a total emotional distress score. Several items are reverse-scored to reduce random responding. The 45-item questionnaire has a score range of 0 to 180. A total score cut-off of 63 or more indicates high levels of emotional distress (19). Concurrent validity estimates for the total score range from .64 to .88. Furthermore, test-retest reliability and internal consistency values for the OQ-45.2 total score range from .84 to .93. The OQ-45.2 is commonly used in conjunction with clinical interviews and intake questionnaires to assess distress among USAF personnel seeking mental health care at local installations, as well as to track progress of mental health treatment.

3.2.2 PTSD Checklist-Military Version (PCL-M). The PCL-M is a 17-item questionnaire assessing symptoms of hyper-vigilance, avoidance, and re-experiencing of events and stimuli representative of a stressful military-related event (20). The items are summed to yield a total score indicating the degree or severity of PTSD-related symptoms. Subjects were asked about symptoms experienced over the past month. The subjects were asked to rate the degree to which they were bothered by each symptom (*not at all, a little bit, moderately, quite a bit, or extremely*) over the past month. Thus, for each item, a severity score is rated ranging from 1 (*symptom did not occur*) to 5 (*symptom was extremely bothersome*). The severity scores for each item were then summed, and a total PTSD severity score (ranging from 17 to 85) was calculated. A previously established cut-off score of 50 or more was used to identify those at high risk of PTSD. This cut-off score has been established for optimal sensitivity and specificity by using a receiver-operator characteristic curve in relation to a structured psychiatric interview for the diagnosis of PTSD as the gold standard. Scores higher than 50 are considered clinically significant (21,22). The three subscales correspond to the criteria clusters in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition. Previous research on the PCL-M indicated mean scores of 64.2 (standard deviation (SD)=9.1) for PTSD participants and 29.4 (SD=11.5) for non-PTSD participants (21).

3.2.3 Instrument Administration. Participation was solicited by line leadership (group, squadron, and flight commanders from active duty, National Guard, and Reserve units) via e-mail and in-person group meetings. Line leadership stated that participation was completely voluntary and individual responses to the questionnaires would remain anonymous and only

accessible to USAF School of Aerospace Medicine researchers. Line leadership encouraged participation to better accurately gauge current levels of distress of those within their chain-of-command so they would be more equipped to make decisions about supportive resources for improving health and morale. Following a brief description and purpose for participation, participants completed the demographics questionnaire, OQ-45.2, and PCL-M at their work sites. In general, it took participants 15 to 20 minutes to complete all the items on the survey. Participants who completed the survey were instructed on how to obtain the general results of the study and when such information would be available.

4.0 RESULTS

4.1 Occupational Stressors Affecting Morale and Distress

Participants' qualitative responses to the item asking them to write in and describe their top three occupational stressors were analyzed. Three behavioral science researchers performed a qualitative analysis on the content of participant responses. The transcripts and notes from each research team member were consolidated into a list of stressors affecting distress levels and morale among the groups (see Table 2). Responses that appeared to label the same or similar stressors were consolidated under a single category. For example, terms such as "rotating shift schedule every 30 days" and "switching from day to swing shift" were categorized under the main stressor of shift work.

4.2 Emotional Distress Symptoms and Clinical Cut-Off Scores

RPA operators had an average OQ-45.2 total score of 43.25 (SD=23.63), and noncombatant airmen had an average score of 36.90 (SD=21.02). An analysis of co-variance conducted to assess for between group differences while controlling for operational variables (rank, time on station, shift work, hours worked per week) and demographic variables (gender, age group, and marital status) was significant, $F_{21} = 5.46$, $p<.0001$. Analyses revealed RPA operators, as a group, have a significantly higher mean total OQ-45.2 score than noncombatant airmen.

It is important to note that an OQ-45.2 total score of 63 may be considered indicative of high (i.e., clinical) levels of emotional distress (23) and an indicator of the need for mental health care due to the presence of high levels of emotional distress (such as anxiety, depression, emotional adjustment difficulties). To further evaluate the prevalence of emotional distress, subjects within each group were separated according to those with OQ-45.2 total scores at and above 63 and those below 63. A total of 131 (20%) RPA operators and 82 (11%) noncombatant airmen had OQ-45.2 total scores at or above 63 (see Figure 1).

Logistic regression revealed a statistically significant difference between groups regarding those reporting OQ-45.2 total scores at or above 63 ($\chi^{17} = 63.90$, $p<.0001$). Subsequent odd ratios revealed RPA operators are 2.3 times more likely (confidence interval (CI): 1.5-2.7) than noncombatant airmen to report OQ-45.2 total scores at or above 63.

Table 2. Top Reported Occupational Stressors Affecting Morale and Distress Levels

RPA Operators (n=670)	AF Control Group (n=751)
Long Hours/Low Manning (e.g., working 50+ h/wk to sustain time suspense missions)	**Financial Concerns** (e.g., economic concern over fiscal cutbacks on resources for active duty)
Rotating Shift Work (e.g., rotating every 30 days between day, swing, and night shifts to sustain 24/7 operations)	**Career Progression** (e.g., access to training and organizational activities leading to on-time promotion)
Deployed in-Garrison Status (e.g., daily balance of warfighter role with domestic life, access to base resources, juggling family/personal relationships)	**Fitness** (e.g., sustaining regular exercise program, meeting fitness standards, access to fitness resources)
Ergonomic Design of Ground Control Station (e.g., problems with seating, lighting, temperature control, inefficient control procedures)	**Occupational Morale** (e.g., engaging in activities to promote communication, team-building, job satisfaction)
Sustaining Vigilance (e.g., vigilance to large amounts visual/auditory data, sustaining attention during long periods of routine)	**Geographic location** (e.g., long commute times, limited base resources and access to medical care)

Note: Combat operations and/or participation in ISR and weapons deployment were not listed as top stressors by any RPA or intelligence operators participating in this study.

Logistic regression of occupational variables (time on station, hours worked per week, shift work) and demographic variables (gender, age, rank, and marital status) also revealed RPA operators working over 50 hours per week were 2.15 times (CI: 1.5-3) more likely and those under the age of 25 were 2.2 times (CI: 1.0-4.8) more likely to report total OQ-45.2 scores at or above 63.

4.3 PTSD Symptoms and Clinical Cut-Off Scores

RPA operators had an average PCL-M total score of 25.07 (SD=10.11), and noncombatant airmen had an average score of 22.57 (SD=7.98). An analysis of co-variance was conducted to assess for between group differences while controlling for operational variables (rank, time on station, shift work, hours worked per week) and demographic variables (gender, age group, and marital status), $F_{21} = 5.89$, $p<.0001$. Analyses revealed RPA operators, as a group, have a significantly higher mean total PCL-M score than noncombatant airmen. No other between group differences was found regarding mean PCL-M total scores.

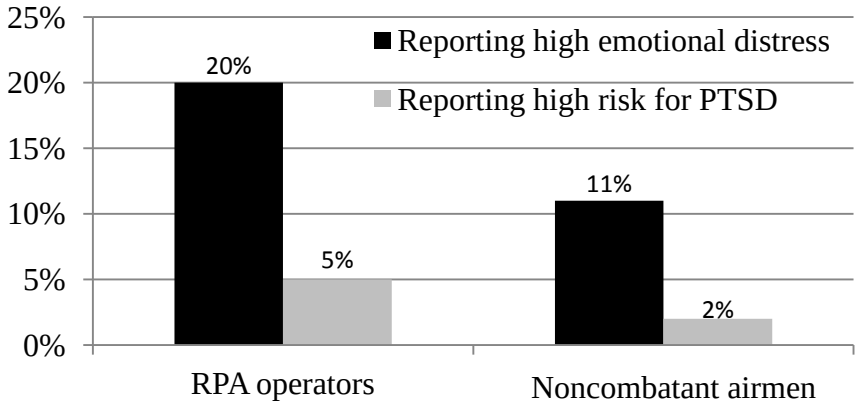

Figure 1. Percentage of Operators Within Each Group Experiencing High Emotional Distress (OQ-45 Total Scores at or Above 63) and at High Risk for PTSD (PCL-M Total Score at or Above 50)

It is important to note that a PCL-M total score of 50 or more may be indicative of someone at high risk for PTSD and is a cut-off score that has been established as providing optimal sensitivity and specificity (22). As a result, subjects within each group were separated into two groups: those below and those at or above a total score of 50. A total of 30 (5%) RPA operators and 11 (2%) noncombatant airmen had PCL-M total scores at or above 50 (see Figure 1). Logistic regression revealed a statistically significant difference between groups regarding the number of those reporting PCL-M total scores at and above 50 ($\chi^{17} = 30.75$, $p<.02$). Analyses revealed RPA operators, as a group, were 3.5 times (CI: 1.5-8) more likely than noncombatant airmen to report scores at or above 50 on the PCL-M.

Furthermore, subsequent odds ratio analyses revealed RPA operators who work more than 50 hours per week are 2.9 times more likely (CI: 1.4-6.3) to report PTSD symptoms at or above the clinical cut-off than noncombatant airmen who also work 50 hours per week. Furthermore, logistic regression revealed RPA operators who are enlisted, are under age 25, have time on station less than 24 months, work swing or night shift, and work over 50 hours a week were 8 times more likely to report having total PCL-M scores above 50.

5.0 DISCUSSION

5.1 Sources and Differences in Sources of Stress Between RPA Operators and Noncombatant Airmen

Consistent with the previous study by Chappelle, Salinas, and McDonald (4), the most commonly cited stressors accentuating occupational stress for RPA operators included long hours (50+ hours a week), shift work, deployed in-garrison status (e.g., juggling demands of warfighter role with domestic duties and personal relationships), ergonomic design of the ground control station (e.g., problems with seating, lighting, temperature, computer-based execution procedures), and sustaining vigilance. There were notable differences in the main sources of stress (e.g., financial concerns, career progression, fitness) when compared with noncombatant airmen from the same installations.

Although financial concerns, career progression, geographical location, and morale were not reported as top stressors, they are still issues that were found to be problematic among RPA operators. A qualitative review of the responses from RPA operators revealed they shared such concerns, but reported the additional stressors of shift work, low manning, deployed in-garrison status, are more a concern at the time of the study. Furthermore, given the requirement to sustain around-the-clock operations, it is not surprising to find RPA operators attributing a moderate to large amount of their occupational stress to long hours (work weeks of 50+ hours) and shift work, which may be, in part, due to low manning. The results of the study reveal the most prominent stressors for RPA operators are consistent with other organizations having to sustain 24/7 operations, long hours, shift work (e.g., medical operational personnel and police agencies) while sustaining high levels of vigilance under routine and emergency conditions.

It is important to note combat-related stressors were not rated within the top sources of stress among RPA operators. Such a finding is helpful for line commanders and medical personnel in understanding occupational stress. However, Chappelle, Salinas, McDonald (4) proposed that such a finding should also be interpreted cautiously when considering individual operators. It is likely there are RPA operators who perceive the deployment of weapons and exposure to live video feed of combat (i.e., destruction/death of enemy combatants and ground forces) as highly stressful (events), even though it is not reported as the main source of occupational stress.

5.2 Differences in Levels of Emotional Distress Between RPA Operators and Noncombatant Airmen

Given the sensitive, high-demand, high-precision nature of USAF RPA Predator/Reaper operations, it is important to military commanders to gauge the prevalence of emotional distress experienced among airmen directly supporting such operations. As mentioned previously, emotional distress may be characterized by negative changes in functioning (e.g., increasing irritability, agitation, and nervousness; difficulty getting along with peers/others; difficulty concentrating) that affect social and occupational performance. Having an awareness of differences in the prevalence of high emotional distress among RPA operators in comparison to noncombatant airmen from the same locations may raise awareness to the potential need for intervention.

The results revealed RPA operators and noncombatant airmen (from support and logistics units) supporting 24/7 “around- the-clock” operations, in general, had average levels of emotional distress when compared with nonclinical samples within the general population. This would suggest that overall general levels of distress affecting occupational and social functioning are similar to the general civilian population and that USAF RPA operators and noncombatant airmen are an emotionally healthy group.

However, it is important to note that after controlling for occupational variables (hours worked per week, time on station, shift work) and demographic variables (age, rank, gender, marital status), between group comparisons revealed RPA operators report higher levels of clinical distress. The results also revealed a larger portion of RPA operators (20%) to be at high risk for clinical levels of emotional distress negatively affecting their occupational or social negative functioning when compared with noncombatant airmen (11%). Overall, one out of every five RPA operators reported experiencing high levels of emotional distress. The results revealed RPA operators were twice as likely to report high levels of emotional distress when

compared with noncombatant airmen. The results also revealed that, in general, RPA operators working over 50 hours a week and under the age of 25 were at greater risk for high levels of emotional distress. The results of the study suggest that group strategies attempting to mitigate the prevalence of emotional distress should be targeted at those working long hours (50 hours or more a week), young airmen (ages 18-25), and RPA operators in general.

5.3 Level of PTSD Symptoms and Differences Between RPA Operators and Noncombatant Airmen

The results of this study reveal RPA operators and noncombatant airmen report average levels of PTSD symptoms consistent with the general population. This finding reveals that the vast majority of RPA operators within the nation's borders that are directly supporting critical, time-sensitive ISR and weapons-deployment operations in regions of conflict across the globe are not experiencing PTSD. This is consistent with the findings reported above regarding exposure to combat as not being a top source of occupational stress.

The results revealed that approximately 5% of RPA operators and only 1% of noncombatant airmen report a frequency and severity of symptoms over 1 month that place them at high risk for PTSD (i.e., total PCL-M scores 50 and above). These percentages are less than 12%-17% of soldiers returning to the U.S. following a 6- to 12-month deployment to the battlefield. However, RPA operators appear to be at much higher risk for PTSD than noncombatant airmen at the same installation. Furthermore, RPA operators who are enlisted, are under age 25, have time on station was less than 24 months, work swing or night shift, and work over 50 hours a week are 8 times more likely to report having total PCL-M scores above 50. As a result, group interventions for mitigating acute stress should likely be targeted toward this group.

5.4 Operational and Medical Command Recommendations

Although this study did not find substantial differences in distress rates within the general population, the findings that 20% of RPA operators report experiencing high emotional distress should not be quickly dismissed. RPA operators are engaged in high-demand, high-precision duties that have significant consequences if mistakes occur (e.g., mission failure, increased threat to national security and international relations). It is reasonable to perceive those experiencing high levels of emotional distress are at increased risk of performance problems. As a result, such operators may benefit from supportive outreach by line and medical commanders tasked with oversight of such airmen/operators.

It is apparent that long work hours, age, and shift work factors that increase risk, are management issues belonging to line commanders. Increasing personnel, decreasing mission requirements, and more equitable distribution of manning to mission ratios across squadrons are paramount to reducing stress levels associated with long working hours. Additionally, reducing the strain of having operators constantly rotate between different types of shifts (day, mid, and nights) is key to minimize disruptions on circadian rhythm adjustments and for having a reasonable level of predictability that is important to balancing war fighter role with domestic duties. It is also important for line leadership to have a strategy in place for delegating and monitoring workload associated with additional taskings. Furthermore, scheduling training regularly for officer and enlisted leadership on recognizing the signs of distress and cultivating

an atmosphere if genuine self-disclosure regarding stress is critical to ongoing monitoring and addressing operator needs. The results of this study suggest that officer and enlisted leadership may need to target younger RPA operators who appear more at risk for clinical distress and PTSD. And lastly, review and improvements to the ergonomics of the workstation will likely help reduce mental fatigue associated with sustaining vigilance under both routine and emergent conditions.

Efforts to increase access to care and identify those at risk are encouraged. Due to the 24-hour nature of such operations, it is likely that operators working swing and night shifts do not have access to care. Extending onsite medical and mental health services to such operators may help to increase utilization of mental health services. In addition, mental health providers should look at developing outreach efforts targeted at RPA operators, as well as those working in units with a younger population working chronically long hours. Intervention may also include mental health consultations with leadership regarding the impact of operational tempo and hours worked on the stress levels of their operators. Another recommendation is the assignment of a dedicated and experienced medical/mental health provider (similar to flight surgeon model of care) to specific units to provide care, as well as to educate leaders and operators on operational stress and interventions. A dedicated provider to specific units will help strengthen the understanding of the organizational and occupational stressors affecting RPA operators' emotional health. The increased understanding and relationship building will also likely improve the capability of mental health providers to make effective discretionary judgments regarding how levels of clinical distress affect performance and sustainment of around-the-clock RPA operations

5.5 Strengths and Limitations of the Study

The survey was a relatively inexpensive option for measuring emotional distress and symptoms of PTSD among such a diverse and large population of airmen. The survey method also had minimal interference on the study population's day-to-day operations, which was a requirement from military leadership. The use of objective, standardized instruments (i.e., OQ-45.2 and PCL-M) improved both the reliability and validity of data obtained. However, the generalizability and validity of the results may be affected by response bias, self-selected volunteer sample, and number of participants. In addition, RPA operators may have been involved in combat situations before entering their current job duties, so current rates of clinical distress and PTSD cannot be attributed purely to their current assignments. As a result, the conclusions of the survey must be interpreted with caution until additional research replicates or produces similar findings. Furthermore, it remains difficult to fully assess the cause-effect relationship between high levels of distress and nature of work.

6.0 CONCLUSION

Given the challenging nature of asymmetrical warfare, efforts should be made to ensure USAF RPA operators supporting around-the-clock ISR and close air support operations from within U.S. national borders have regular access to mental health care. To optimize performance of RPA operators, it is essential commanders understand the occupational stressors and prevalence of emotional difficulties experienced by airmen who support the front lines of the battlefield. The existent body of literature is replete with articles furthering our understanding of

the psychological effects of war. However, the use of RPA assets in support of ISR and combat operations, although actively in use for over a decade, is a relatively new way of warfighting that bears a psychological impact on service personnel in such a way that remains largely unclear. What is clear is that RPA operators are showing signs of psychological distress as a result of the work they perform. Much like their counterparts who deploy directly to combat zones, RPA operators are faced with participating in life or death decisions of enemy combatants and bearing witness to the consequences of their decisions and operations they surveil. The results of this study support the perception that USAF RPA operators suffer rates of emotional exhaustion and clinical distress above USAF controls and the general population. The predominant stressors are long work hours and shift work. Those factors are especially significant if the service member is under age 25. Deployment of weapons in combat operations was not listed as a major stressor even among those who screened positive for PTSD. PTSD due to military operations, although likely present, was not seen as a major occupational issue with RPA operations.

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LIST OF ABBREVIATIONS AND ACRONYMS

CI	confidence interval
ISR	intelligence, surveillance, and reconnaissance
OQ-45.2	Outcome Questionnaire-45
PCL-M	PTSD Checklist-Military Version
PTSD	post-traumatic stress disorder
RPA	remotely piloted aircraft
SD	standard deviation
USAF	United States Air Force