Cry in the sky: Psychological impact on drone operators

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Drone operations have added a new chapter to modern warfare. They may not guarantee immediate territorial gains but can significantly influence ideological and political alignment of the adversary at a cost which is much lower than conventional war. However, drone operators, which include remote pilots, intelligence coordinators, and other support staff, may face important psychological issues which may affect their mental health and operational efficiency. We conducted a nonsystematic narrative review of the articles dealing with the issue and found that drone operators and support staff have higher chances of suffering from emotional disengagement, Post Traumatic Stress Syndrome (PTSD), emotional exhaustion, and burnout. The scope of the article does not cover the psychological effect on the targeted populations or political and ethical issues dealing with drone warfare.

Military psychology deals with the application of principles of psychology in military training, discipline, and combat behavior. Ever since large-scale military operations were launched, military leaders have exploited human mind’s strengths and weaknesses in ensuring success. Although the specialty was formally founded during World War I, it gained importance during the Second World War for assessment and screening of military personnel.[1] In the subsequent period, it has made significant inroads into multiple facets of modern warfare. Tactical psychology on the other hand is art and science of exploiting human weakness – encouraging the enemy to run, hide, or surrender. When applied strategically, it helps to win wars without significant loss of lives on both sides.[2] Although it was systematically introduced in early 20th century, such tactics have been applied by astute warriors and military commanders since time immemorial. However, in the modern era, objectives of war are gradually shifting from annexing territory toward ideological, political, or financial gain and alignment. Therefore, symbolic holding of territory may not be of much importance when skies are still under adversary’s control. Introduction of drone technology into the war machinery is now changing the dynamics of military conflicts in the 21st century. Operators of these machines face numerous challenges and may suffer psychological distress. The identity of the drone operators and their support staff often remain shrouded in mystery and studying their distress can be difficult. The article will

Keywords: Burnout, drone operator, intelligence coordinator, moral injury, unmanned aerial vehicle

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end with recommendations for its detection and mitigation to preserve their operational efficacy.

**METHODS**

We conducted a nonsystematic, narrative literature search using Google Scholar and PubMed employing the following search terms: drone, unmanned aerial vehicle (UAV), pilot, aircrew, mental health, depression, moral injury, posttraumatic stress disorder intelligence, surveillance, reconnaissance, and remotely piloted aircraft.

**MODERN WARFARE AND DRONE TECHNOLOGY**

Any military conflict entails major loss of life and property. Nations across the world have steadily invested to incorporate latest developments in defense-related technologies. Incorporation of modern gunnery, ballistic missiles, and avionics has played a decisive role in major wars and hostilities in recent times. The first account of an aerial attack was in Italian–Turkish war of 1911–1912. However, airpower has steadily gained importance and now air superiority plays a key role in determining the military outcomes. General Giulio Douhet wrote that “he who controls the air controls everything.” The role of air superiority gained further importance in the second world war and all the subsequent conflicts including India Pakistan wars, Israel Egyptian war, Gulf war, and Kargil war. However, air superiority always came at a cost. The military aircrafts are expensive and require maintenance and rigorous training for air as well as ground crew. There is a significant risk to pilots owing to parallel development of antiaircraft guns and missile technology. Therefore, there have been major efforts to obviate this limiting factor while sustaining air superiority.

Drone technology or popularly known as unmanned aerial vehicles (UAVs) offer an enticing option to overcome these limitations. It is now becoming increasingly clear that all major military missions in the future will rely heavily on them. Their surveillance and reconnaissance potential are used by over 70 nations around the globe and over 3 dozens have weaponized drones. The use of drone strikes by Azerbaijan against Armenia in the recent past quickly provided decisive victory and control over disputed territories. Drones offer tactical advantage at a much lower cost with no risk to the pilot. Further, they can be precise in their strikes owing to sustained surveillance. It is because of these key advantages that drones have caught the imagination of a modern force commander who realizes their potential over traditional war machinery. When the operations linger for a long time, they ensure sustained public support which may wane off otherwise as the costs of war escalate. As with any other agents of death, injury, and disability, drone technology too throws certain challenges that affect those who operate them.

The current article delves into the psychological issues affecting drone pilots and support crew.

**COMPOSITION AND ATTRIBUTES OF DRONE OPERATION CREW**

Typically, drone ground crew consists of a team having a pilot, sensor operator who operates the camera and guides the missiles and a mission intelligence co-coordinator who communicates and relays important information to and from other intelligence analysts. As can be imagined, the team needs to work closely and for long intervals of heightened vigilance and exposure to high-definition combat-related imagery. The workstation is typically air-conditioned stacked thousands of miles away from real action. Although it is difficult to highlight all the tasks of this team, their main role lies in sustained surveillance of primarily innocuous terrain interspersed with high voltage target identification and weapon delivery. Such sudden shifts between and silent observer to a combatant or psychological whiplash may be source of stress among drone operators. They experience paradox of being thousands of miles from their targets yet only inches away from the screen thus creating compression of time and space. At the end of shift, drone operators may go home to their families without experiencing the dust, heat, and the fear of dying that happens with burnout conventional warfare. They may also not enjoy the camaraderie of fellow soldiers and the opportunity to share feelings based on common experience. It is understandable that selection criteria for such operators and team members will also be different from standards for flying manned aircrafts. The United States Armed forces are now in the process of laying down basic standards for the selection of drone pilots, sensor operators, and intelligence coordinators. Other nations are also likely to follow suit to prevent attrition and to minimize errors while operating drones.

**STRESSORS AND THEIR EFFECTS ON DRONE OPERATORS**

As compared to manned aircraft pilots, who carry out the mission after taking specific orders from their superiors, drone pilots are more deliberate in their strikes. They generally indulge in surveillance in a state of heightened vigilance for prolonged durations which may extend from weeks to days. They along with their teams remain glued to screen showing images of different time zones for long hours. Unlike, manned aircrafts they do not have to “commute to the battle field” and may not experience the adrenaline rush or thrill of accomplishing the mission. In
fact, they are generally thought to have outsourced the risk. Unlike, traditional pilots and judgmental errors of drone operators are not easily condoned as they have more time to study their targets. Unlike fighter pilots, drone operators continue observation after the strikes to assess the extent of damage. They may be exposed to disturbing imagery of death and destruction.\textsuperscript{[13]} It is especially important as the team would have studied the routine life of the targets and may have even started getting psychologically connected with them. Unlike traditional fighter pilot, they may not be able to share their experience with their colleagues and may remain anonymous. They may also not get adulation of the population; they serve despite achieving the objective. For obvious reasons, coveted titles such as bravery, courage, valor, honesty, or integrity may not be applicable for drone operators and their teams and hence may miss recognition or gallantry awards. Instead, drone operators and their team members may rather match profile of a nerd who is generally seen as an overly intellectual, obsessive, introverted person with undue interest in highly technical or abstract things.\textsuperscript{[14]} Military commanders may have to make concessions for their unusual skills but it may not happen at all times. One of the narratives strongly rooted in popular and academic perception is that their actions match playing a video game. The very act of striking a target or distant killing creates a “PlayStation mentality” with joystick as a trigger.\textsuperscript{[15]}

Variety of studies conducted on drone crew have consistently proved higher incidence of psychiatric symptoms than their compatriots who operate manned aircrafts.\textsuperscript{[16]–19]} Majority of studies were conducted on Reaper and Global Hawk drone operators which are weaponized drones. Around 46%–48% of them suffered from significant psychiatric symptoms which were severe enough to affect their job performance or family life. The main psychiatric symptoms ranged from sadness, guilt, poor concentration, irritability, anxiety, and sleep disturbance. 8.2% of this population received their first mental health diagnosis within 24 months of starting drone operations. The most common diagnosis was adjustment disturbance. 8.2% of this population received their first mental health diagnosis within 24 months of starting drone operations. The most common diagnosis was adjustment disorder.

Burnout is a syndrome of emotional exhaustion and cynicism that occurs often among individuals involved in stressful work for long duration. Normally, missions continue 24 h a day, 7 days a week and can get physically and mentally exhausting. It can lead to lowered work efficiency and probability of errors. Owing to lowering of emotional resources, workers may develop negative views about themselves and others. People experiencing emotional exhaustion often feel like they have no power or control over what happens in life. They may feel “trapped” or “stuck” in a situation. Owing to stressful work for prolonged duration, drone operators may feel emotionally exhausted and experience burnout. It may lead to errors of judgment and negative fallouts. The Maslach Burnout Inventory-General Survey (MBI-GS) is often used to measure levels of occupational burnout among workers.\textsuperscript{[23]} It examines three facets of occupational burnout: emotional exhaustion, cynicism, and professional efficacy. Among active duty and reserve predator/reaper drone operators, it was found that between 14% and 33% scored above the clinical cut-off for emotional exhaustion, 7%–17% scored above the clinical cut-off for cynicism, and 0%–6% scored below the clinical cut-off for professional efficacy.\textsuperscript{[24]} Another study examined occupational burnout in intelligence coordinators and found that 26.6% scored above the clinical cut-off for emotional exhaustion, 20.8% scored above the cut-off for cynicism, and 5.9% scored below the cut-off for professional efficacy.\textsuperscript{[25]} Among drone operators and ground staff involved in drone operations, sleep quality was reported as either poor or nonrefreshing and the sample consistently scored above cut-off for fatigue levels. Importantly, 40% of predator/reaper operators reported that they were likely to fall asleep while on duty owing to chronic sleep deprivation.\textsuperscript{[26]} Precipitating factors for these findings were noted to be working over 50 h a week, being under 25 years old, working swing/night shifts, and working in the current position for over 24 months. Surprisingly, these findings match with those found in jobs required prolonged computer use. It is noteworthy that a prolonged stressful white collared job with sleep deprivation, long working hours with limited time for fitness routine may be a significant risk factor for all-cause mortality, diabetes, cardiovascular disorders, and other metabolic disorders. The findings have an important message. As the dynamics of military warfare evolve in the 21\textsuperscript{st} century, more and more reliance is likely to be placed on drone operations and it will be important to
Moral injury is a term that has been used to describe the impact of various acts of omission or commission in war that goes against deeply held moral beliefs and expectations. Moral disengagement is a related construct that prevents moral injury in those who indulge in inherently immoral tasks but are able to disengage from it. Moral disengagement is a term from social psychology for the process of convincing that ethical standards do not apply to them in a particular context. For example, by killing a terrorist, a soldier may feel proud or happy but the very act of killing may be immoral for him. Similarly, drone operators are causing death and destruction of targets without fully knowing their actual antecedents or probability of retaliation. In addition, many bystanders are also killed or maimed inadvertently. Therefore, it is quite probable that many drone pilots or intelligence coordinators may develop moral injury. They may experience existential conflict, guilt, and remorse after indulging in killing as aerial snipers and witnessing collateral damage following their strikes. However, lack of it may be termed as moral disengagement. It may lead to changes in their personality or may reflect in their interpersonal relationships. Although there may not be any risk of physical injury in the drone operators, because of inherently immoral or unethical act of killing a person who cannot retaliate from a distance may be disturbing to many. It may lead to inner conflicts, a sense of guilt or remorse or even aversion from the task. International Humanitarian Law regulates conduct of warring parties in any war like situation. “Jus in bello” condition is a related term which seeks to minimize suffering in armed conflicts, notably by protecting and assisting all victims of armed conflict to the greatest extent possible. Merely thinking of lower probability of future violence, drone operators may morally disengage from their acts but it may not hold true for every case or for too long. Modern warfare is often ambiguous and dynamic and rules of engagement may not be very clear for everyone. Therefore, it is reasonable to expect an element of moral injury or moral disengagement in drone operators. There are hardly any systematic studies in this regard but area is wide open for the same. Moral disengagement has been studied in violent video gamers. The results showed that violent video game exposure was positively associated with disinhibition, moral disengagement, and the four aggressive traits (verbal aggression, physical aggression, anger, and hostility), which were positively associated with each other. Theoretically, the findings can be extrapolated for drone operators in view of striking similarity between the two scenarios though military training and resilience may be confounding factors. Therefore, the construct needs to be addressed in all those who may be involved in tasks related to causing death and destruction.

SUMMARY AND CONCLUSION

It is acknowledged that drone operations are a recent phenomenon and not much research has been undertaken on the psychology of a drone operator and the psychological impact of drone operations. It is further compounded by the fact that the majority of such operations are shrouded in mystery and access to the drone crew is not always easy. Acknowledging psychiatric symptoms have often been viewed as a sign of weakness among members of armed forces so that may lead to under-reporting. Majority of the data on the web is available from defense portals of the United States Armed Forces. India too has acquired sufficient drone capability but not much is known about their role and their operators. In conclusion, the current study is a brief review on the psychological issues which may affect drone operators. Due to novelty of the concept, there is a paucity of controlled studies for the selection of candidates for this role. It is, therefore, important to systematically incorporate selection and screening protocols for operators of drone technology. Existing studies in this field consistently highlight that the field is stressful but necessitates precision and intact cognitive and mental abilities. Any errors could prove costly and may lead to mission failure. The rates of emotional fatigue and burnout are significant higher but can be controlled by simple measures like good workplace ergonomic principles. Some of the suggested methods include regulating work hours and rotating shift duties, filtering relevant data, and adequate staffing. Moral injury and disengagement are of concern but can be handled with sensitivity and inculcating esprit de corps.

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