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Modern Warfare, Spiritual Health, and the Role of Artificial Intelligence

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Abstract: Modern warfare utilizes artificial intelligence (AI) combined with remotely piloted aircraft (RPA) to enhance battlefield strategy and create advantages against adversaries. Military drones extend the range of combat, which limits risks, thereby minimizing casualties and loss of human life. With onboard AI systems, drones provide more data and facilitate rapid decision-making for greater situational awareness during conflicts. Military leaders also theorize that remote missions would be physically, emotionally, and psychologically easier for drone pilots, thus reducing mental health issues that plague fighter pilots. However, the intersection of AI with military drones creates unique situations of stress and trauma. RPA personnel manifest symptoms of post-traumatic stress disorder (PTSD) that adversely affect their spiritual health and well-being.

Keywords: artificial intelligence; drone; remote warfare; spiritual health; PTSD; ethics; spirituality

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1. Introduction

Artificial intelligence (AI) technology combined with remotely piloted aircraft (RPA) are the latest weapons modern warfare employs to gain strategic advantages in battle. Military drones extend the field of combat, which minimizes the number of casualties and loss of human life. AI programs quickly analyze huge amounts of data from surveillance and intelligence gathering missions to assess frontline conditions in real-time. Another perceived benefit is that remote operations should be physically, psychologically, and emotionally easier than fighter pilot experiences in war zones. But instead of mitigating war's damaging effects on RPA soldiers' mental and spiritual health, drone pilots exhibit comparable levels of post-traumatic stress disorder (PTSD) as fighter pilots do. It seems that remote military missions inadvertently create unique situations of stress and trauma that results in PTSD, which adversely affects a soldier's spiritual health and well-being.

Although fully autonomous AI systems alleviate some of the occupational stress and trauma that precipitates PTSD, they also introduce ethical issues involving moral agency, accountability, and transparency. Interestingly, artificial intelligence, along with machine learning, assists in the diagnosis and treatment of PTSD. These technologies evaluate each warrior's condition and then develop customized recovery plans. Additional methods that restore mental and spiritual health involve religious rituals, prayers, ceremonies, and personal narratives. Each technique rebuilds relationships and reaffirms human dignity.

2. Purpose and Intended Use of Military Drones

Modern warfare has operated remote-controlled aircraft since the early twentieth century for intelligence, surveillance, and reconnaissance missions. With the latest AI and communications technology innovations, remotely piloted aircraft or unmanned aerial vehicles, commonly called drones, become increasingly important components in military operations. The term "unmanned" is a misnomer because military personnel pilot and operate drones from remote locations. RPA operators assess potential targets, monitor compliance with rules of engagement, and perform logistical search, rescue, and transport

missions; in essence, they execute dangerous tasks that often result in loss of human life, but at safe distance from the combat zone.

Remote operators likewise manage system command, control, and communications functions. Real-time communication between the drone and human operator is crucial. Controlling the drone as it enters contested airspace or analyzing data for pattern-of-life detection and targeting priorities requires a form of human-machine teaming with rapid communication. AI algorithms deliver quick drone control and tactical synchronization in dynamic combat settings. For complex missions, the degree of autonomy "depends on the agent's or vehicle's own abilities for sensing, analyzing, communicating, planning, deciding, and acting" (Reding and Eaton 2020, p. 60) in addition to limiting the amount of associated risk. Yet, this rapid-fire type warfare increases the remote pilot's stress and cognitive load.

Human-machine teaming at high speeds is a significant advantage on the battlefield. However, military leaders claim that human operators are no longer fast enough to make timely decisions. Experts advocate for quicker responses using full AI autonomy, which removes humans from the military kill chain loop during drone operations. Nevertheless, it is United States policy that "regardless of the level of autonomy of unmanned systems, target selection will be made by an 'authorized human operator'" (United States Department of Defense 2012). From an ethical viewpoint, maintaining a human in the military kill chain decision loop is vital for ensuring moral agency, accountability, and trust.

The intended consequences of AI-assisted drone warfare are to limit risks to pilots, reduce warrior and civilian casualties, prevent excessive property destruction, reduce budget spending, and improve operational effectiveness. The ability to kill at a distance significantly increases a soldier's chance of survival. Historically, longer forearms, swords, or lances have a distinct advantage in hand-to-hand combat. Darts, catapults, spears, and crossbows also extend attack distances. AI and drone technology are the most recent military innovations to leverage the distance advantage. RPA missions are more accurate and efficient, thus "projecting power without projecting vulnerability" (Jackman 2020, p. 95) to adversaries. State-of-the-art satellite navigation and communications data provide "precise positioning and an ability to control robotic weapons, such as unmanned aircraft, from anywhere on earth" (Riza 2014, p. 260). Consequently, capabilities to surveil, identify, target, and strategically kill at a distance avoid placing soldiers in harm's way during dangerous battlefield operations.

3. Unintended Consequences of Military Drones

Another intention of the AI-enhanced drone program is to distance fighter pilots from combat situations in order to reduce guilt and psychological issues associated with battlefield killing. This perceived advantage entails the idea that remote pilots experience a distanced indifference, an apathy to killing an enemy that derives from "the notion that we care less for people who are far away from us, either literally or owing to some form of social or cultural distance" (Gill 2016, p. 22). Although significant physical distance theoretically makes missions easier to accomplish, it has the unintended consequences of inhibiting remote pilots from feeling empathy or sympathy for their victims. Comparable to a sniper's rifle scope, drone video provides RPA operators with some psychological distancing to mentally compartmentalize and disengage themselves from the violence of their mission. Using the terms "prey" or "high-value target" also objectifies people and inhibits feelings of compassion for them. Without a battlefield ethos for wartime victims, RPA personnel may become so psychologically and emotionally disassociated from their actions and results that they no longer value the dignity or meaning of human life. Such moral distancing diminishes a person's perceived ethical responsibilities. Distance then becomes a defense mechanism that establishes boundaries between the self and the other during traumatic circumstances.

3.1. Videogame Similarities

Remote killing alters a soldier's experience of war. RPA pilots observe continuously updated, highly detailed, near real-time video of the combat zone from an approximate distance of eighteen inches between their eyes and the monitors. This spatial arrangement creates an "intimate proximity" (Jackman 2020, p. 94) relationship with the people being surveilled or targeted for an imminent mission. This view is closer to the ground than a fighter pilot's glimpse of battlefield violence after dropping a bomb from fifty-thousand feet. Destruction occurs thousands of miles away as drone operations instantaneously confirm the mission's success or failure on video screens within arm's reach.

Watching real-time battles unfold on audiovisual monitors contributes to AI drone technology's videogame-like nature, which blurs distinctions between real war conditions and simulated ones. The persistent surveillance of remote warfare becomes a form of stalking; it resembles the voyeurism snipers experience as hunter-killers seeking their prey. With a birds-eye view of death and destruction, some RPA pilots feel omniscient and powerful. Similar to videogames, drone operators become invisible and invulnerable; they feel exempt from assuming any moral responsibility for their actions against victims seen as abstract, depersonalized objects or mere statistics. Remote drone missions, unlike videogames, do not possess a "reboot" or "start over" functionality that erases accidental civilian casualties or unwarranted lethal force from "'trigger-happy' excitement like that experienced in fast-paced videogames" (Asaro 2013, p. 200). Yet because of the proximity mediated by video terminals, RPA pilots are aware that the mission's target is a human being. Videogame similarities may exist, nevertheless, remote operators are capable of distinguishing between reality and videogames and understanding the consequences of their actions.

3.2. Asymmetrical Conflict

The radical asymmetry of AI-enhanced drone warfare introduces more unintended consequences. One issue is whether remote combat violates the laws of just war theory. Just war may include RPA support during battlefield conflicts, however, conducting drone strikes outside a war zone is questionable. In non-combat situations, determining evidence of an imminent attack is difficult, so applying deadly force (remote or otherwise) poses just war concerns and possible legal issues according to the rules of international humanitarian law. With advanced artificial intelligence surveillance capabilities, drone operators have additional moral responsibilities to ensure target selection is defensible and to use justifiably proportionate and discriminate force to prevent innocent civilians from being harmed. Although the probability of success for drone strikes usually is high, proportionality regarding damages should account for not only deaths and injuries, but moral, political, and societal reactions to vulnerability and injustice that often precipitates terrorism and retaliation.

A second concern pertains to the nobility of risk and what it means to actually engage in combat. While "no principle of just war theory bars distant warfare . . . it seems morally problematic if one side is able to kill freely without having to submit to the same equality on the field of battle" (Riza 2014, p. 268) or render judgments from remote and unequal perspectives. Therefore, battlefield soldiers claim that RPA operators are cowards, that dying via drones violates human dignity, and that remote warfare "lacks the honor or justice of combat in which the soldiers from each side can both kill and be killed" (Asaro 2013, p. 200). The state and society justify asymmetrical aspects of RPA warfare as part of their moral obligation to protect the lives and welfare of military personnel. They claim it would be unethical to subject soldiers to unnecessary risks. Yet questions persist over whether remote pilots using AI technology merit the coveted, often romanticized warrior status. In the military, there exists a "perceived lack of prestige associated with being a drone operator, compared to a traditional pilot" (Asaro 2013, p. 205). This lack of respect often excludes remote operators from pilot comradery and emotional support as well as equal access to promotions and career growth.

3.3. Occupational Stress

Remote warfare generates a unique combination of emotional and occupational stressors. The continuous exposure to conflict from real-time video, audio, and artificial intelligence technologies is "both universal and unique [since] such surveillance is often vivid and prolonged" (Chappelle et al. 2019, pp. 86–87). Drone operators frequently form emotional bonds with their intended targets that produce distinct types of anxiety and combat-related stress after receiving then implementing their kill orders from thousands of miles away.

Another unusual source of tension involves juggling military duties with domestic tasks. RPA pilots compartmentalize their lives to cope with the "psychological complexity of moving back and forth, on a daily basis, between remote combat operations" (Asaro 2013, p. 205) and family life. Drone operators describe continually switching between these contexts as "surreal . . . [a] yo-yo of emotion between gearing up for the business of death and winding down so as not to bring it home" (Riza 2014, p. 264). This situation aggravates job-related stress and lowers morale. Remote pilots feel isolated because they are unable to form battlefield relationships or share top secret or classified missions with family members.

Managing powerful military drones with innovative AI technologies likewise cause remote operator stress. Sophisticated communications and AI applications introduce a mediating layer of difficulty and interpretation for RPA pilots during mission planning. Awkward ergonomic drone cockpit designs require precise eye-hand coordination while executing complex verbal instructions during combat. Consequently, "approximately 80% of the mishaps attributed to human error were actually the result of poorly designed interfaces, insufficient training, or both" (Asaro 2013, p. 210). Novel technological human enhancements, combined with artificial intelligence applications designed to facilitate rapid decision-making, include "non-invasive neurological and neuromotor interfaces, virtual environments, biosensors, new visualization approaches, and controls" (Reding and Eaton 2020, p. 63). However, poorly designed human-machine interfaces, with their effects on cognition and memory, frustrate operators, increase casualty risks, and impede remote combat effectiveness.

Remote combat is a twenty-four hour, seven days-a-week enterprise that involves long hours and rotating shift work. These conditions cause sleep deprivation and impede physical fitness and proper nutrition. Additionally, the increased use of drones creates greater labor demands for people with highly-technical, remotely piloted aircraft skillsets. Given the amount of physical and emotional stress from overwork caused by longer hours, understaffing, and extra duties, burnout is fairly common. In fact, "almost a quarter of the Air Force's remote warriors are suffering from occupational burnout, psychological distress, or PTSD" (Tennies 2019, p. 83). The military prefers to classify remote operator stress as occupational burnout rather than a medical condition. Yet ethical questions arise when distinguishing "between psychological stress that interferes with job performance (burnout) and psychological stress that interferes with daily life or mental health (PTSD)" (Asaro 2013, p. 214). These actions imply that promoting drone operator mental health is not an end, but a means toward retaining highly skilled personnel.

4. Military Drones and PTSD

Drone and AI technologies are increasingly prevalent in military strategy. However, instead of reducing the emotional horrors of war, remote drone missions appear to be psychologically detrimental to a soldier's mental and spiritual health. In addition to the experiences of burnout and distress, RPA personnel have a heightened risk of suffering post-traumatic stress disorder (PTSD). Symptoms include feelings of fear, nervousness, or panic, nightmares, intrusive memories, and traumatic flashbacks, as well as hyperarousal and suspicion from perceiving the world and others as unreliable and dangerous. PTSD should not be confused with post-traumatic stress (PTS), which is the normal, short-term "fight-or-flight" mind-body response that occurs during or immediately after a stressful,

traumatic incident. Events ranging from car accidents to military combat can trigger PTS, but it rarely develops into PTSD.

It is difficult to predict how people will react to traumatic situations. Research on PTSD estimates that "the lifetime prevalence among U.S. civilians is about 7% [while among veterans] lifetime estimates can be as high as 30%" (Jain et al. 2011, p. 26). Soldiers deployed in the combat zone have an increased risk of experiencing PTSD. Individual study results differ with an overall range from 4% to 34.84% (Chappelle et al. 2019, p. 87). Data among United States Air Force remote operators also vary. In a 2014 psychological study, 4.3% of 1,084 drone operators met the criteria for moderate to extreme levels of PTSD, which is "lower than rates of PTSD (10–18%) among military personnel returning from deployment, but higher than incidence rates (less than 1%) of United States Air Force drone operators reported in electronic medical records" (Chappelle et al. 2014, p. 483). A 2019 study indicates that 6.2% of RPA personnel met the criteria for PTSD while another 8–20% with sub-threshold PTSD displayed symptoms that contribute to potential flight accidents (Chappelle et al. 2019, pp. 91–92). Warning signs, such as the inability to sleep or stay awake, difficulty concentrating, and irritable behavior all inhibit peak physical and vital cognitive functions crucial for operating some of the most sophisticated, innovative, AI-assisted drone technologies currently in remote combat.

Variability in the data indicates differences in how symptoms are measured, each study's design, and the characteristics of the population assessed (sample bias). Moreover, drone operators often fail to report psychological symptoms or seek treatment for various reasons. They fear breaching top-secret protocols or being stigmatized by superiors and colleagues. Pilots worry about being "grounded," reassigned, or discharged from duties. Study results also reflect that "the USAF has embedded operational clinical psychologists with high-level security clearances within active-duty drone units" (Chappelle et al. 2014, p. 483). Increased access to treatment and removing the shame linked with mental health care reduces psychological stress before it results in a clinical diagnosis of PTSD.

The fundamental nature of AI-assisted drone warfare along with its paradoxical work environment exacerbate PTSD symptoms. Though RPA operators may be safe from battlefield injuries, nothing protects them from the intense psychological and emotional harm of combat. A misconception exists that because remote personnel are not physically located in war zones, they do not experience PTSD. However, studies show that drone pilots "have consistently proved higher incidence of psychiatric symptoms than their compatriots who operate manned aircrafts" (Saini et al. 2021, p. 17) and actually exhibit symptoms more typical of ground troops than fighter pilots (Pinchevski 2016, p. 64). RPA operators visually experience combat and its effects through enhanced video, AI, and communications technology. They likewise share similar duties with combat troops to observe, access, and report the extent of death and destruction inflicted by their respective strikes.

Another significant PTSD predictor involves the act of killing and being accountable for it. For occupations involving danger, such as fighter or remote pilots, combat soldiers, or police officers, the incidence of post-traumatic stress disorder is higher for members who had killed or seriously injured a person in the line of duty than for those who had not taken a life (Chappelle et al. 2019, p. 87). In particular, 33% of RPA pilots and sensor operators reported negative emotional responses to killing enemy combatants via missile strikes (Wood et al. 2017, p. 490). The frequency and circumstances of witnessing civilian bystander deaths during drone missions also contribute to developing PTSD symptoms, especially when drone operators assume a sense of shared responsibility for those injuries or deaths. Even though RPA warfighters may psychologically process killing enemies as justified, killing bystanders has a deeper emotional effect on them (Chappelle et al. 2019, p. 92). These reactions indicate that drone pilots value human life; they take the use of remote lethal force seriously, regret their mistakes, and ethically assume culpability for their actions.

5. PTSD and Spiritual Health

The trauma of combat elicits existential questions that religion and spirituality seek to address. Religious traditions introduce a variety of worldviews through beliefs and practices that offer answers to humanity's ultimate concerns. Spirituality is more personal; it assimilates "morality, life's meaning and purpose, hopelessness and despair, rage and grief, betrayal and trust, theodicy, and the empowerment to keep on going" (Berg 2011, p. 1) often with experiences of transcendence or connectedness to a higher being or power. Very stressful situations and trauma not only challenge a person's existential religious and spiritual beliefs, they frequently change one's perceptions of life. For many soldiers, PTSD from combat trauma precipitates grief, disappointment, confusion, and spiritual distress. These feelings are a starting point for queries about what it means to have faith. Beliefs that previously sustained military personnel become internal spiritual struggles that directly influence a warrior's ability to cope with PTSD.

Post-traumatic stress disorder adversely affects the body, mind, and spirit, which are three interconnected elements comprising a person's spiritual health. Because "human bodies are 'beings-in-the-world' and [thus interrelated to] the material 'reality' of robotic warfare" (Holmqvist 2013, p. 543), this association irreversibly blurs boundaries between the corporeal (human) and the incorporeal (drone AI technology). Any actions on or by the former directly affect the latter, and vice versa. Remote pilots direct drone movements while AI technology sees and displays the destruction, which causes the pilot physical and emotional stress. These reactions often manifest as PTSD, which damages a remote pilot's spiritual health.

When PTSD impairs spirituality, it causes feelings of abandonment and the fear of punishment that lead to overwhelming depression and loneliness. Eventually, people lose purpose, hope, and joy; they question life's meaning and faith in their perceptions of a loving God. Research with Vietnam veterans, survivors of the 9/11 attacks, and others encountering traumatic stress show "that 10% to 16.7% reported becoming less spiritual" (Currier and Drescher 2014, p. 4) and that these changes correlate with increased PTSD and other psychiatric problems. Further studies "suggest that combat trauma might weaken aspects of spiritual functioning [due to] guilt over combat-related experiences" (Currier and Drescher 2014, p. 4) and a crisis of conscience. Eventually, one's diminished spirituality erodes interpersonal relationships, resilience, and coping skills.

Sometimes a traumatic experience increases closeness to God, provides joy and a greater appreciation for life, and generates a new, meaningful purpose. In time, it also enhances spiritual well-being. Many veterans claim their religious or spiritual beliefs are a significant coping mechanism during times of stress or depression. A study involving RPA pilots concurs with data demonstrating a beneficial "relationship between spiritual well-being and lower levels of depression, anxiety, stress, loneliness, and risk behaviors" (Wood et al. 2017, p. 492). The study also suggests that healthy spirituality may mediate PTSD symptom severity in drone pilots as well as feelings of anger, rage, and revenge. Access to spiritual advisors and pastoral counselors helps reinforce religious beliefs and heal spiritual anguish through forgiveness, compassion, and optimism. Sound religious and spiritual beliefs constitute an inner strength so drone operators can recover and plan for the future.

Nevertheless, paradoxical feelings of technological closeness, combined with distant surveillance and killing, intensify RPA operators' struggles with existential and spiritual issues. These difficulties reinforce either positive worldviews or maladaptive ways of comprehending remote warfare. During AI-drone mediated conflict, killing occurs with immunity. Without the personal risks of death from combat, RPA operators experience greater traumatic stress and perceive themselves as "victims as well as killers" (Brown 2016, p. 198). Drone pilots "are very much aware of the reality of their actions, and the consequences it has on the lives and deaths of the people" (Asaro 2013, p. 221) in a war zone. Therefore, executing numerous kill strike missions and then witnessing the detailed destruction in real-time on high-definition monitors take a toll on RPA operator emotions

and spirituality. Lengthy surveillance likewise personalizes the enemy which makes "the act of killing him or her all the more traumatic and morally disconcerting" (Brown 2016, p. 203) while increasing the vulnerability of drone pilots to PTSD. Remote personnel also face internal ethical struggles because they are unable to render medical aid or protect children from harm. Physical immunity from danger evidently does not offer emotional, psychological, or spiritual immunity from the realities of war.

Spiritual challenges occur on the battlefield and during remote AI-assisted missions. The heat of combat frequently requires soldiers to violate their own sense of morality. Such a disruption of a person's values and ethics results in moral injury, a psychological condition in which a person constantly questions his or her decisions and behaviors. Drone pilots are susceptible to "potentially morally injurious events, such as perpetrating, failing to prevent, or bearing witness to acts that transgress deeply held moral beliefs and expectations" (Litz et al. 2009, p. 695). This vulnerability leads to conflicts of conscience, increases the risk of developing PTSD, and becomes a liability during remote warfare.

6. Methods for Treating PTSD and Restoring Spiritual Health

The number of post-traumatic stress disorder cases among military personnel creates significant challenges to staffing and retaining qualified, combat-ready drone operations teams. Efforts to reduce PTSD include contextual, environmental, and procedural changes to remove stress and avoid burnout; still, trauma affects a person's physical, mental, and spiritual health. Reassessing military strategy and deployment involving autonomous AI technology is one approach. Artificial intelligence and machine learning also are beneficial in detecting PTSD and customizing therapies. Another method is embedding qualified clinical psychologists on station who combine standard PTSD therapeutic methods with a holistic approach that includes religious rituals and mystical practices to assist AI-drone personnel in restoring their spiritual health and well-being.

6.1. Autonomous AI Drones

Interestingly, artificial intelligence applications provide solutions to mitigate remote warfare-induced PTSD from AI technology and other causes. As part of its long-term strategy, the military is developing and deploying fully autonomous, AI-directed drone systems to remove remote pilots entirely from the mission kill loop. At the present time, unmanned aerial vehicles are not totally autonomous. Remotely piloted drone operations are very labor-intensive and require special communication and technology skills along with quick decision-making abilities. Thus, human beings are in the killing loop, with complete control over mission implementation. Semiautonomous AI systems possess the sophistication to analyze, decide, and act during operations involving minimal risk. Yet, human beings remain on the killing loop, with veto power over mission execution.

Fully autonomous AI-directed aircraft require no remote pilots, so human beings are out of the killing loop, which reduces their risk of PTSD and harm to their spiritual health. Employing massive amounts of data and advanced programming, these highly-complex AI systems rapidly analyze multiple combat scenarios, coordinate numerous tasks, and synchronize communications, which results in faster decisions and response times during missions. Nevertheless, the decision-making capabilities of completely independent AI algorithms do not possess moral agency. Lethal autonomous weapons systems (LAWS) make rational assessments but not necessarily moral ones. These systems require a "method of moral-scene assessment for intelligent systems, to give AI programs a 'proto-conscience' that allows them to identify in a scene the elements that have moral salience" (Swett et al. 2019, p. 141). Identification involves encoding LAWS with agreed-upon human values, morals, and ethics without introducing societal bias and prejudice into the AI decision-making process.

Although tempting, the abdication of personal autonomy and responsibility to AI systems is unethical; it questions the notion of free will and underestimates or ignores the role and responsibility of human agents in the process. AI algorithms are computationally

intelligent; however, they lack the emotional intelligence of human beings who "exercise leadership, inspire a team effort, persuade, empathize, and create human bonds between persons" (Wood 2020, p. 88) while respecting everyone's intrinsic dignity. In the future, general artificial intelligence systems may develop into independent, causal, moral agents. Until then, AI applications (especially lethal drones) are a means to help humanity in making ethical judgments on the battlefield and in remote combat situations. Even though AI systems are complex, soldiers should be able to understand their results and provide justification and accountability for the decision-making process.

Compared with RPA drone missions, fully autonomous AI systems reduce human involvement in decision-making, control, and responsibility for executing outcomes. Yet, AI-autonomous drones might create more stress for remote operators. As AI advances, "swarms of low-cost, autonomous air and space systems can provide adaptability, rapid upgradability, and the capacity to absorb losses that crewed systems cannot" (Reding and Eaton 2020, p. 61). Instead of one remote pilot directing one drone system, each operator might control multiple AI-swarming drone systems. The increased machine speeds at which such weapons operate compress human decision-making and reaction times. Also, swarming systems require additional organizational complexity that includes intricate trajectory planning and collision avoidance strategies. Coordinating a mission involving hundreds of synchronized, highly-responsive drone swarms exacerbate RPA operator combat anxiety and PTSD symptoms.

6.2. AI Therapy for PTSD

Ironically artificial intelligence and machine learning techniques assist in detecting and managing post-traumatic stress disorder. Utilizing biosensors and nanotechnology, AI provides pre-symptomatic diagnosis and real-time monitoring for effective treatment of complicated combat injuries, especially for PTSD. Severe stress manifests in various ways and degrees during the first hours to days after the traumatic event. Because "there is evidence that timely intervention may reduce the risk of developing psychopathology after trauma" (Malgaroli and Schultebraucks 2020, p. 275), rapid, accurate AI predictive evaluations are vital to medics dealing with battlefield trauma and clinical psychologists managing drone pilot post-traumatic stress and burnout. The prompt diagnosis and risk assessment, targeted treatment, and digital monitoring of the recovery process all prevent combat trauma from becoming a chronic, debilitating illness.

In determining a diagnosis, soldiers recount their traumatic combat experiences while AI applications passively observe then analyze speech patterns, facial expressions, and hand movements. Natural language processing (NLP) algorithms likewise determine predictive patterns of intonation, speed, and word frequency as well as content. Cameras concurrently capture posture, physical activities, as along with facial expressions and eye movements that artificial intelligence uses to evaluate a patient's emotional and mental state. After diagnosis, mobile and AI wearable devices continuously collect a patient's data and personal digital phenotypes by "assessing sleep quality and physiology . . . using GPS data to monitor avoidance and behavioral activation . . . [and] analyzing the speed and accuracy of keystrokes, taps, and swipes" (Malgaroli and Schultebraucks 2020, p. 277) when patients use their smartphones. AI-driven diagnostic programs perform statistical analysis on this raw data then combine it with deep transfer learning to achieve a more accurate, nuanced PTSD diagnosis.

A one-size-fits-all therapeutic approach for PTSD frequently overlooks important distinctions among the various origins, responses, and symptoms associated with this psychiatric condition. AI applications and machine learning are well-suited to manage the massive amounts of diverse information necessary to detect indications of PTSD and to develop effective customized therapies that match an individual's needs. Deep machine learning uses neural networks to identify then predict patterns or models from complex interactions between multiple variables within massive datasets. Algorithms analyze data from structured interviews describing combat experiences and causes such as genet-

ics, neuroendocrinology, metabolomics, plus observed clinical symptoms (Malgaroli and Schultebraucks 2020, p. 273). AI-personalized treatments, telehealth videoconferencing, and asynchronous multimedia messaging, provide effective, real-time PTSD therapy. AI applications collect and analyze digital data automatically for up-to-the-minute patient assessments, then notify therapists with suggested clinical and behavioral interventions or in some cases whether the patient is a potential suicide risk.

Utilizing AI in the diagnosis and treatment of PTSD offers therapeutic advantages, but it also entails some ethical challenges. Artificial intelligence is only as ethical as its data, algorithms, and human contributions to system functionality. Due to their novelty and technological complexity, artificial intelligence programs and machine learning are confidential or patented; thus, they are not very transparent. Without transparency, AI outcomes are difficult to reproduce, test, interpret, and critique. Developers are creating new interpretation techniques to explain predictive models, enhance reproducibility for independent testing, and create safeguards for statistical errors. Human-understandable AI algorithms and step-by-step simulations improve clarity and comprehension as well as instill confidence in the diagnosis and treatment of PTSD.

In addition to transparency, accountability and trustworthiness are necessary in the AI-assisted diagnosis and treatment of PTSD. Thus, accountability enhances confidence by explaining choices, identifying culpability, and determining ways to prevent future issues. Trust in AI system components essentially relies on the integrity and competency of analysts, designers, and developers. Training, experience, and prudent judgment are essential attributes for creating trustworthy applications. Trust also develops from using several historically-proven, dependable datasets and running multiple AI programs against them to reach a decision. Since deep transfer learning shares patient information between training models and multiple datasets, confidentiality and sensitive healthcare records must be protected. Each step in the process should comply with HIPPA rules and regulations and include human oversight and periodic audits. Employing cybersecurity technology likewise reduces unauthorized access and system manipulation. The ability to trace data back to original sources decreases the risk of unethical tampering and increases confidence in AI results.

6.3. Religious Rituals and Spiritual Development

Artificial intelligence applications provide sacred writings, devotional prayers, and interactive worship via the internet. Nevertheless, AI robots and interactive technologies currently lack sufficient empathic programming to make them effective at counseling and reestablishing spiritual health. The relationships people develop with or through these devices differ from conventional human interactions. Until AI technology significantly improves in the areas of mental and spiritual health, religious rituals and practices offer effective methods for coping with combat-induced PTSD and its subsequent harm to a person's physical, mental, and spiritual well-being. In selecting beneficial treatments, mental health and pastoral care professionals should carefully evaluate whether PTSD affects a client's religious and spiritual beliefs to avoid inappropriate theological or ethical topics during therapy. In appropriate cases, counselors encourage patients with PTSD to participate in spiritual and religious activities. Religious rites and spiritual practices foster connections with family and the community that help restore meaning, purpose, and hope lost during wartime trauma. Some suggested activities to improve spiritual health include attending religious functions, volunteer work, and practicing meditation, mindfulness, journaling, as well as enjoying nature.

The military is assessing a spiritual practice called mantram repetition, to improve a person's focus and attention. Repeating sacred phrases such as *Ave Maria*, *Om Mani Padme Hum*, or *O Wakan Tanka* throughout the day is a soothing mindfulness technique. It offers "significant reductions in perceived stress and anger and improvements in existential spiritual wellbeing and quality of life" (Bormann et al. 2012, p. 497). Taking time each day to reconnect with one's spirituality calms the mind while creating peace and clarity to cope

with PTSD symptoms. Practicing mantram repetition while in a relaxed state teaches a person to regulate emotional responses in stress-triggering situations.

American Indian cultures demonstrate their deep respect for soldiers with special rites and spiritual traditions that prepare them for battle and help reintegrate them into society. The ritual contains two parts: "When soldiers go overseas, we give them warrior ceremonies to armor and protect them against the battle; when the soldier returns; we have to remove that armor, to help him reconnect with his home" (Palmer 2015, p. 88). Adapting these traditional spiritual transition ceremonies to accommodate modern drone warfare helps RPA fighters cope with switching between their communities and remote combat conditions on a daily basis. Whether serving on site or on station, soldiers hold a special place of honor in American Indian communities. Spiritual rituals and communal dances celebrate soldier and veteran sacrifices, which are comparable to non-indigenous peoples' parades, dinners, and welcome home receptions.

Faith-based organizations (FBOs) provide a variety of services to assist soldiers as they readjust to civilian life. Veterans' most crucial needs are privacy, confidentiality, and a non-judgmental environment, especially when confronting the stigma of PTSD (Werber et al. 2015, p. 8). Counselors must be sensitive to how religious and societal perspectives influence a warrior's emotional interpretation of war trauma as glorified, sacrificial, or karmic. If the veteran is deeply spiritual or professes a strong religious faith, counselors and pastors should not discount, but gently affirm, notions of sin, right and wrong, and feelings of guilt so the person might seek comfort and healing from familiar rituals and personal, spiritual relationships with ultimate reality. After establishing a basis for trust as a "benevolent moral authority, [counselors offer] 'psychospiritual' or strictly spiritual support that enables veterans to open up, 'reawaken,' and regain a vision for their lives" (Werber et al. 2015, p. 6). FBOs concentrate on spiritual assistance, but they also provide access to social, physical, and mental health services along with educational, vocational, financial, and legal support. This myriad of services reflects a holistic approach to healing PTSD and integrating veterans back into society.

Moreover, religious traditions provide specific rituals and prayer services that help heal and reconnect veterans with families, friends, and a faith community. Rituals provide significance, promote community participation, and transmit traditions and wisdom that enhance identity, meaning, and belonging. Religious rites also require self-awareness, and reflection. Veterans suffering from PTSD often are unable to accept self-forgiveness, the forgiveness of others, or a sense of divine forgiveness. The Catholic Church mediates God's mercy and forgiveness through its communal rituals known as sacraments. Each sacrament communicates God's healing grace to restore and strengthen one's spirituality, self-esteem, and vital relationships with the divine and with the community. Baptism, for example, initiates a loving relationship with God and the Eucharist celebrates communion with God and each other. During Anointing of the sick, the physically, spiritually, and mentally ill share a special unifying experience with the entire Church community who is praying for them. Whether through healing, regeneration, or wellness, the person attains a wholeness and integrity of body, soul, and spirit.

The sacrament of Reconciliation (Penance) unites God's mercy with a person's faith. Nevertheless, the desire for "healing must come from within [and one] must be open to receiving help" (Cooke 1994, p. 175) by admitting brokenness and dependence, then showing a willingness to trust the love of others. Acknowledging human transgressions and faults evokes healthy feelings of remorse and contrition through which God acts to forgive, heal, and restore damaged relationships with the divine, the community, and oneself. Reconciliation does not suppress the memory of violence; it does not mediate, but gently confronts lingering internal conflict. Hence, the healing process of reconciliation reestablishes psychological and spiritual health by recognizing a person's dignity.

For veterans experiencing PTSD, sharing personal narratives contextualizes actions, feelings, and thoughts in broader patterns of life. Counselors and pastors create safe spaces for interaction and dialogue that enable narratives to neutralize the destructive

effects of societal violence and wartime suffering. Adaptive Disclosure is a cognitive-based therapy treatment designed specifically for military personnel. Actively listening to RPA operators' personal experiences and eyewitness accounts of violence and evil acknowledges the trauma causing mental and spiritual harm. These stories piece together the fragments of identity and memory that slowly reestablish trust and thus restore one's humanity. Similar to the Sacrament of Reconciliation, narratives do not deny or forget the past; instead, they remember it in ways that heal spiritual, emotional, and psychological, wounds caused by PTSD. Such dialogue reconnects interpersonal relationships and achieves a sense of justice and dignity.

7. Conclusions

Military warfare, whether conducted on the battlefield or remotely with drones and artificial intelligence technology, still involves risk factors that often lead to a diagnosis of post-traumatic stress disorder. While intended to reduce casualties, trauma, and stress, AI-assisted drones create unexpected consequences that change the combat experience. These consequences inflict psychological trauma and emotional stress on RPA personnel, at times leading to PTSD and diminished spiritual health. From continuous surveillance, drone pilots form personal connections with the targets of subsequent kill missions, then witness a person's death and destruction in real-time on high-definition monitors. As a result, the paradoxical intimate proximity of remote conflict plays havoc with a drone operator's psyche. These unusual combat conditions and occupational stresses increase the risks of PTSD and generate existential questions concerning a drone operator's morals, ethics, and spirituality. As the number of cases increase among RPA pilots, the military has an ethical obligation to focus on effective strategies that mitigate the remote combat causes of PTSD and develop effective methods to treat soldiers and restore their spiritual health.

Active military personnel and veterans rely on a healthy spirituality to help them cope with PTSD symptoms and the ugly brutality of war. The increased use of AI drone technology, therefore, requires concurrent measures to remove conditions proliferating PTSD, which harm spiritual health and well-being. Ironically, AI applications improve the diagnosis and treatment of PTSD. Various religious rituals, ceremonies, and counseling additionally nourish, heal, and reintegrate a warrior's body, mind, and spirit. Completely autonomous AI drones also reduce stressors leading to PTSD, yet they introduce ethical and moral issues to military warfare ethos. Because artificial intelligence technologies lack moral and ethical reasoning as well as the emotional intelligence to respect soldiers' lives and dignity, warfare must remain a human venture. To remove RPA operators from the kill loop is unethically abdicating decision-making and accountability, which permits fully autonomous AI-controlled drones to weigh warrior lives (including their spiritual and psychological health) against strategic combat gains. Without human judgment and involvement, these weapons may pose greater problems for the future of modern warfare.

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