Occupational Health and Safety of Nigerian Air Force Personnel, Infantry Soldiers and Mechanized Armoured Tank Crews, with Evidence from Europe and the United States of America

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Abstract

Military occupational health and safety (OHS) is inseparable from operational readiness, personnel welfare and the long-term sustainability of armed forces. Nigerian Air Force personnel, infantry soldiers and mechanized armoured-vehicle crews encounter overlapping but occupationally distinctive hazards: aircraft noise and vibration, jet-fuel and exhaust exposure, fatigue and high-consequence decision-making in aviation; combat trauma, heavy load carriage, heat strain, sleep disruption and musculoskeletal injury among infantry; and whole-body vibration, acoustic trauma, restricted egress, heat, fumes and communication difficulties among armoured crews. This article examines these risks in Nigeria while drawing comparisons with research and prevention approaches from Europe, North America and other military settings. It adopts a structured narrative literature review methodology, synthesizing peer-reviewed research, systematic reviews, occupational health guidance, and relevant Nigerian studies published mainly between 2023 and 2026, alongside foundational work where recent evidence is limited. Recent reviews show that military and law-enforcement populations experience a broad spectrum of adverse outcomes, including mental ill-health, hearing loss, musculoskeletal disorders, heat illness, sleep problems and burnout. Nigerian evidence identifies psychological distress among deployed soldiers and air-force personnel, while international studies provide more detailed evidence on load carriage, jet-fuel exposure, fatigue, noise and vibration. The article argues that Nigeria requires a role-specific, prevention-led military OHS system supported by exposure monitoring, confidential health surveillance, fatigue-risk management, equipment maintenance, heat controls, hearing conservation, post-deployment support and a stronger local research programme. Because available Nigerian studies are often cross-sectional or facility-specific, international findings should inform, not substitute for local exposure measurement and longitudinal research.

Keywords: Military occupational health and safety, Nigerian Air Force; Infantry; Armoured vehicle crews, Jet fuel, Fatigue, Heat stress, Noise-induced hearing loss, Musculoskeletal injury, Military mental health

Introduction

Armed forces are workplaces in which routine occupational hazards coexist with deliberate exposure to danger, uncertainty and extreme physical demand. The military mission does not remove an 2001; International Organization for Standardization [ISO], 2018; World Health Organization [WHO],

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2010). Military OHS therefore includes conventional occupational hygiene and safety, as well as operational medicine, ergonomics, fatigue management, psychological health, injury prevention and rehabilitation. An umbrella review by Stegerhoek et al. (2024), synthesizing 34 systematic reviews covering 43 countries, identified 26 adverse health outcomes and 220 associated risk factors among military and law-enforcement populations. The conditions included musculoskeletal injuries, stress fractures, neck pain, noise-induced hearing loss, insomnia, sleep-disordered breathing, heat illness, concussion, depression, anxiety, post-traumatic stress, alcohol misuse and burnout. This breadth demonstrates that military OHS cannot be reduced to battlefield casualties or emergency medical response alone.

The occupational profiles of air-force personnel, infantry soldiers and armoured crews differ in important ways. Aircrew and ground aviation workers may be exposed to aircraft noise, vibration, jet fuel, exhaust, solvents, high workload, circadian disruption and fatigue-related impairment. Infantry personnel face load carriage, repetitive marching, weapon handling, blast and ballistic hazards, thermal stress, terrain-related injuries and psychological exposure to threat. Armoured crews work in confined spaces around engines, weapons, tracked or wheeled vehicle systems and communications equipment; they may experience high noise, whole-body vibration, heat accumulation, restricted movement and delayed escape in an emergency. The same individual may also move between training, deployment, maintenance, transport and recovery tasks, making cumulative exposure important.

The Nigerian context makes prevention particularly important. Personnel may undertake counter-insurgency, internal security, peace-support, training and routine base duties in climates ranging from humid coastal environments to hot, dry northern regions. Equipment, infrastructure, occupational-health staffing, operational tempo and access to specialised rehabilitation may vary between locations. Research on Nigerian soldiers deployed against Boko Haram has documented psychological distress associated with military service characteristics and rank (Umeh et al., 2024). A longitudinal study of Nigerian Air Force personnel exposed to counter-insurgency operations has also examined the incidence and predictors of mental disorders (Akinlose et al., 2026). In a separate study, Salihu et al. (2026) reported greater psychiatric morbidity among combatants than non-combatants in a sample at Sobi Cantonment. These studies provide context-specific evidence, although their samples should not be treated as nationally representative.

International literature can help identify hazards and workable controls where Nigerian data are scarce. Research in the United States has examined occupational exposure to jet fuels and fatigue countermeasures for military pilots; British military studies have measured thermal demands during fitness testing; and Canadian research has measured noise and vibration inside armoured vehicles. European and international reviews have examined military load carriage, injury mechanisms and rehabilitation. The purpose of comparison is not to assume that a Nigerian unit has the same aircraft, vehicles, workload or medical resources as a European or US unit. Rather, international findings provide hypotheses, measurement approaches and prevention principles that can be adapted and evaluated locally (Nakashima et al., 2007; Stegerhoek et al., 2024; Vincent-Hall et al., 2025; Orr et al., 2025).

Despite the strategic importance of the Nigerian Armed Forces, the accessible literature on military OHS remains uneven across occupational groups and hazard types. Nigerian studies provide useful information on combat injury, psychological distress and quality of work life, but there is comparatively limited publicly available, peer-reviewed exposure research on aircraft maintenance chemicals, airfield noise, cockpit fatigue, heat load during field operations, infantry load carriage, and noise and vibration inside Nigerian armoured vehicles. A lack of published evidence does not prove that these hazards are absent or unmanaged; it indicates that the scale, distribution and control effectiveness of exposure are difficult to evaluate independently.

The problem is compounded when safety performance is judged principally by accidents, injuries or operational outcomes. Occupational disease can develop gradually and may not be recognized until hearing loss, chronic musculoskeletal pain, sleep disturbance, respiratory symptoms or psychological difficulties affect performance and quality of life. The 2025 systematic review of occupational jet-fuel exposure found 28 epidemiological studies, 18 of them military, but concluded that evidence for several outcomes remained limited or indeterminate because studies were sparse and often of lower quality (Vincent-Hall et al., 2025). This illustrates why precautionary exposure control and better surveillance are warranted even when the causal evidence is not definitive.

The central research problem is therefore how Nigeria can develop an evidence-based, role-specific military OHS system for Air Force personnel, infantry soldiers and mechanized armoured crews while drawing critically on international evidence. The article addresses four questions: what principal occupational hazards affect these groups; what does recent Nigerian and international literature establish about their health and operational consequences; which prevention measures appear transferable to Nigerian settings; and what research and institutional priorities are needed to improve military OHS?

Methodology

The methodology adopted includes structured narrative literature review. The article uses a structured narrative literature-review design rather than primary field data collection. The review was organized around three occupational populations, including Air Force personnel, infantry soldiers and mechanized armoured-vehicle crews, and cross-cutting themes of physical injury, occupational hygiene, fatigue, thermal stress, psychological health, health surveillance and organizational safety. The main emphasis was on literature published from 2023 to 2026. Earlier studies were retained when they provided foundational evidence or when recent, directly relevant studies were scarce, especially for armoured-vehicle noise and vibration.

The literature base was identified through scholarly and bibliographic platforms commonly used for occupational and military-health research, including PubMed/MEDLINE, Google Scholar, Research Gate records, Springer Link, Science Direct, BMJ Military Health, PubMed Central, and relevant institutional sources. Search concepts combined military populations and occupational hazards, for example, “military occupational health”, “Nigerian Army mental health”, “Nigerian Air Force counter-insurgency”, “military load carriage”, “armoured vehicle noise vibration”, “jet fuel occupational exposure”, “military pilot fatigue”, “heat stress soldiers” and “military musculoskeletal injury”. Search-engine and repository records were used to identify studies; where possible, bibliographic details and findings were checked against journal or PubMed records. ResearchGate was treated as a discovery and author-sharing platform rather than as a substitute for the original journal record.

Priority was given to systematic reviews, peer-reviewed empirical studies and research with clearly described methods. Relevant occupational-health guidance and institutional reports were used to frame practical controls. Evidence was synthesised thematically rather than statistically because the included studies differed in population, exposure definitions, outcomes, measurement techniques and national military settings. The review is not a formal systematic review or meta-analysis: it does not claim exhaustive retrieval, formal duplicate screening, or pooled effect estimates. This limitation is important because the strength of each conclusion depends on the quality and transferability of the underlying evidence. Nigerian findings are distinguished from evidence generated in other countries, and cross-sectional associations are not presented as proof of causation.

Discussion of Findings

Military OHS as a system of prevention

The evidence supports a broad definition of military OHS that combines occupational hygiene, ergonomics, medical surveillance, organizational design and operational risk management. Stegerhoek et al. (2024) show that military and law-enforcement health outcomes arise from multiple interacting factors rather than one isolated hazard. Physical conditioning, equipment fit, prior injury, sleep, exposure duration, rank, social support and organizational climate can modify risk. This means that safety interventions focused solely on individual resilience are inadequate where work schedules, equipment design, maintenance practices or command decisions continue to generate excessive exposure.

A useful approach is the hierarchy of controls: eliminate a hazard where feasible, substitute a less hazardous process or material, apply engineering controls, use administrative controls, and then rely on personal protective equipment for residual risk. For military operations, complete elimination is not always possible; nevertheless, maintenance planning, safer fuelling procedures, ventilation, noise reduction, improved equipment fit, exposure limits, work-rest cycles and rehabilitation can reduce avoidable harm. PPE remains essential but cannot be treated as a universal solution, particularly when it adds heat burden,

restricts movement, impedes communication or is poorly fitted (Graham et al., 2025; Orr et al., 2025; ISO, 2018).

OHS performance should be assessed through leading and lagging indicators. Leading indicators include the proportion of personnel receiving fit-for-task training, compliance with hearing protection, heat-risk assessments completed before field exercises, maintenance defects closed, fatigue reports reviewed, and time taken to investigate near misses. Lagging indicators include injury rates, hearing-threshold shifts, heat illness, days lost to musculoskeletal disorders, psychological morbidity and aviation or vehicle incidents. Combining the two makes it possible to identify deteriorating conditions before serious harm occurs.

Nigerian Air Force personnel: aviation, maintenance and fatigue hazards

Air-force OHS extends beyond pilots. Aircraft technicians, ground crew, refuelling teams, weapons specialists, firefighters, air-traffic and operations personnel may encounter noise, vibration, fuels, exhaust, solvents, lifting hazards, electrical energy, fire and blast risks. Exposure patterns differ by trade and task; a pilot's principal concern during a sortie may be fatigue and cognitive workload, while a ground technician may experience repeated chemical contact, awkward postures, noise and manual handling. A sound programme therefore requires task-based exposure assessment rather than a single generic "air-force risk" category.

Jet fuel deserves particular attention because aircraft servicing and fuel handling can involve inhalation and dermal exposure (Risher et al., 2017). Vincent-Hall et al. (2025) reviewed 28 epidemiological studies and found slight evidence of associations with neurological, cognitive/behavioural, respiratory and cancer outcomes, while evidence for other outcome categories remained indeterminate. The authors also emphasised limitations in the available studies. This finding should not be exaggerated into a claim that every fuel exposure causes disease; equally, uncertainty should not be used to justify unprotected handling. For Nigerian bases, practical priorities include closed or low-spill fuelling systems where feasible, suitable gloves and eye protection, ventilation in maintenance spaces, prompt management of spills, worker training, skin hygiene, and records of task, duration and incident exposures.

Airfield noise and aircraft-related vibration require structured monitoring. Exposure can vary with aircraft type, engine run-up, proximity to operating aircraft, duration of duty and whether maintenance is performed inside hangars or outdoors. Hearing conservation should include baseline and periodic audiometry, noise mapping, properly selected hearing protection, training in fit and use, and investigation of threshold shifts (National Institute for Occupational Safety and Health [NIOSH], 1998). Where communication is safety-critical, hearing protection must be compatible with radio and warning systems; otherwise, personnel may remove it or fail to hear essential signals. The general military evidence reviewed by Stegerhoek et al. (2024) identifies noise-induced hearing loss as a recognised outcome in military and law-enforcement populations.

Fatigue is an equally important aviation hazard. Night operations, early reporting times, irregular duty rosters, long deployments, interrupted sleep and circadian disruption may affect vigilance, reaction time, memory and decision-making. A 2025 systematic review by Alzahrani et al. evaluated seven studies of fatigue countermeasures for military pilots and concluded that some interventions, including caffeine and modafinil, may provide short-term performance benefits, but do not fully restore baseline performance during severe sleep deprivation. The review supports a layered approach rather than reliance on stimulants: adequate sleep opportunity, roster design, planned rest, fatigue reporting, supervisory awareness and validated countermeasures under medical oversight. Pharmacological measures should not substitute for safe scheduling.

Nigerian evidence should be interpreted carefully but not ignored. Akinlose et al. (2026) conducted a six-month follow-up study of Nigerian Air Force personnel exposed to counter-insurgency operations, addressing the incidence and predictors of mental disorders. The longitudinal design is valuable because it moves beyond a single-time-point survey, although further replication across commands and occupational specialties is needed. For broader military healthcare personnel, Isah et al. (2024) studied quality of work life and job satisfaction across three military hospitals in Nigeria. Their analysis found that years of experience and prior posting to war areas were associated with quality-of-work-life outcomes. Although

healthcare workers are not interchangeable with pilots or ground technicians, the study reinforces the importance of deployment history and working conditions in military occupational wellbeing.

Infantry soldiers: load carriage, musculoskeletal injury and field exposure

Infantry duties combine high physical demand with uncertainty and exposure to environmental hazards. Marching, patrols, rapid movement over uneven ground, casualty evacuation, digging, weapon handling and carrying ammunition or communications equipment can impose repeated loads on the lower limbs, back, shoulders and neck. Military load carriage is not simply a fitness issue: the weight and distribution of equipment, footwear, terrain, pace, duration, body composition, previous injury and heat conditions influence biomechanical and physiological strain (Knapik et al., 2004; Walsh & Low, 2021). A systematic review of military load carriage and gait reported consistent changes in trunk, hip and knee mechanics and increased activation of lower-limb and trunk muscles, while also noting heterogeneity among studies (Walsh & Low, 2021).

Recent research continues to refine measurement. Graham et al. (2025) reviewed novel approaches to evaluate military load carriage, including biomechanical and physiological measurements that can help identify characteristics associated with performance and injury. Orr et al. (2025), in an international review of rehabilitation for load-carriage tasks, emphasized the importance of restoring the specific capacities required for military duties rather than relying exclusively on generic rehabilitation. These findings support progressive conditioning, load-specific training, injury surveillance, equipment fit, adequate recovery and rehabilitation that tests whether personnel can safely resume occupational tasks.

Load carriage also interacts with heat. Body armour, helmets, packs and protective clothing may limit heat dissipation and increase metabolic demand. In hot and humid conditions, sweat evaporation may be less effective, while high work rates and limited water access can increase heat strain. A British military observational study and randomized trial examined the thermal demands of the annual fitness test and reported that some recruits exceeded a core temperature of 39.5°C during field observations, with the load-carriage stage particularly demanding (Waldock et al., 2026). Such findings are not direct estimates of Nigerian heat illness rates, but they demonstrate why a physically demanding test can produce clinically important thermal strain even in a controlled military training setting.

In Nigeria, heat-risk controls should account for regional climate, acclimatization, clothing and body armour, exertion, hydration, work-rest schedules and access to shade or cooling. Supervisors should be trained to recognize early signs of heat illness and to activate a clear emergency response. Training intensity and duration may need adjustment using locally appropriate heat-stress assessment, rather than fixed schedules that ignore conditions (NIOSH, 2016; Parsons, 2014). Hydration alone is not sufficient if work rate remains excessive and personnel have no opportunity to recover. Conversely, heat management must not compromise tactical requirements; the goal is to plan activity and recovery so that avoidable physiological collapse is less likely.

Infantry personnel also face blast, gunshot, fragment, vehicle, falls and training injuries. Hussain et al. (2021) examined combat injuries sustained by troops during counter-terrorism and counter-insurgency operations in north-eastern Nigeria, offering locally relevant evidence that operational injury prevention must address both the immediate mechanism of injury and the wider chain of evacuation and treatment. Such injury studies generally describe those who reach care and may underrepresent minor injuries, unreported symptoms or delayed consequences. A comprehensive OHS programme should therefore integrate operational medical records with confidential reporting, rehabilitation, return-to-duty assessment and longitudinal follow-up (National Academies of Sciences, Engineering, and Medicine, 2019).

The psychological demands of infantry service are also substantial. Umeh et al. (2024) examined psychological distress among 256 Nigerian Army non-commissioned officers deployed against Boko Haram and found that rank and service characteristics were associated with distress. Salihu et al. (2026), in a separate cross-sectional comparison of 297 Army personnel at Sobi Cantonment, reported psychiatric morbidity in 55.0% of combatants compared with 22.3% of non-combatants. These figures should not be extrapolated to the entire Nigerian Army because the sample was based at one cantonment and screening and diagnostic procedures have specific limitations. Nonetheless, the contrast supports targeted, confidential screening and accessible support for personnel with combat exposure, repeated deployment, sleep problems or functional impairment.

Mechanised armoured tank crews: noise, vibration, heat and confinement

Armoured vehicle crews operate within a work environment shaped by vehicle design, engine and track systems, weapons, communication equipment, confined geometry and mission duration. Noise may arise from engines, tracks, weapon systems, ventilation, radio headsets and external firing. Whole-body vibration varies with vehicle platform, seat design, speed, terrain and maintenance condition. Crew posture may be constrained for long periods, while protective equipment and restricted movement can complicate thermal regulation and rapid exit. These hazards may occur simultaneously, so a crew member's total risk cannot be inferred from a single noise reading or a general vehicle specification.

Although direct contemporary evidence from Nigerian armoured vehicles is limited in the publicly accessible literature, Canadian measurements remain instructive. Nakashima et al. (2007) measured noise and vibration in Canadian Forces armoured vehicles and recorded noise as high as 115 dBA in one platform, with vibration increasing on rough terrain. The study is older and should not be treated as a measurement of Nigerian vehicles; its value is methodological, demonstrating that exposure can vary sharply between platforms, crew positions and operating conditions. More recently, van Besouw et al. (2024) discussed practical considerations for assessing crew noise exposure in armoured vehicles, including intermittent noise and the contribution of communications-system output. The implication is that monitoring should represent actual duty cycles and crew positions rather than relying only on external or stationary measurements.

A vehicle-level assessment should measure noise at relevant crew positions and operating phases, including idling, movement on different surfaces, firing or simulated firing where safe and authorized, and radio use. Personal dosimetry can help estimate individual exposure over a shift. Whole-body vibration assessment should consider terrain, speed, seat suspension, maintenance and duration of exposure. Engineering measures may include seat and suspension maintenance, noise-damping materials, improved acoustic isolation and communication systems that allow adequate speech intelligibility at lower sound levels. Administrative measures include limiting unnecessary exposure, rotating tasks where operationally feasible and monitoring symptoms. Hearing protection must remain compatible with crew communication and warning signals.

Heat and fumes are additional concerns in enclosed vehicles. In hot weather, vehicle interiors may retain heat, especially when ventilation or cooling is inadequate and crews wear helmets, body armour and other protective equipment. Exhaust intrusion, fuel vapours, lubricants and maintenance chemicals can create further exposures if seals, ventilation or engine systems are defective. The practical response is preventive maintenance, inspection of ventilation and exhaust pathways, safe refuelling and maintenance procedures, thermal monitoring during prolonged training, and emergency plans for vehicle breakdown or evacuation. Vehicle crew training should include recognition of heat illness, hearing symptoms, vibration-related discomfort and the procedures for reporting equipment defects.

The National Institute for Occupational Safety and Health (NIOSH, 2026) describes a health-hazard evaluation involving whole-body vibration among range operators and recommends approaches such as vibration dampening, limiting rough-terrain exposure, controlling speed and job rotation. While this work is not a direct study of Nigerian tank crews, its control logic is relevant to military vehicle operations. Adaptation should be guided by vehicle-specific measurements and mission constraints rather than copied mechanically from another force.

Psychological health, sleep and organisational conditions

Psychological health is both an occupational outcome and a determinant of safety-critical performance. Combat exposure, uncertainty, moral injury, bereavement, repeated deployment, sleep disruption, perceived lack of control, family separation and organizational stress can contribute to anxiety, depression, post-traumatic stress symptoms and other forms of distress. Military work may also create stigma around disclosure if personnel fear that asking for help will harm promotion or deployment opportunities. A workable programme therefore needs confidential assessment, clear clinical pathways, command education, reintegration support and policies that distinguish help-seeking from misconduct (WHO, 2022).

Nigerian studies provide several strands of evidence. Umeh et al. (2024) investigated mental health among non-commissioned soldiers deployed to Boko Haram zones. Akinlose et al. (2026) followed Air Force personnel exposed to counter-insurgency operations over six months. Salihu et al. (2026) compared combatants and non-combatants and found higher psychiatric morbidity among combatants in their sample. A study of military personnel in a Nigerian barrack also reported burnout and psychological distress, recommending periodic screening (Aguwa et al., 2022). These studies vary in design, population and measures; together they justify further investigation rather than a single national prevalence estimate.

International evidence similarly treats mental health as a product of interacting individual and occupational factors. Stegerhoek et al. (2024) identify stress, anxiety, depression, PTSD, insomnia, sleep-disordered breathing and burnout among the outcomes examined in military and law-enforcement reviews. Sleep is especially important because fatigue can undermine judgement, communication, marksmanship, driving and aviation performance even in the absence of a diagnosable mental disorder. Military aviation fatigue literature also suggests that countermeasures work best as part of a system in which schedules and rest opportunities are addressed, rather than as isolated individual interventions (Alzahrani et al., 2025).

Organizational conditions influence whether hazards are reported and controlled. A climate in which personnel fear punishment for reporting near misses, fatigue or symptoms may produce deceptively low incident statistics. A learning-oriented reporting system should protect good-faith reporting, investigate underlying causes and communicate corrective action (Reason, 1997). Supervisors should be trained to identify deteriorating work conditions, but they should not be expected to diagnose mental disorders. Occupational-health professionals need enough independence to advise commanders on fitness, exposure controls and return-to-duty decisions.

Comparative lessons from Nigeria, Europe and the United States

The United States has invested in exposure assessment and evidence synthesis for military environmental hazards. Vincent-Hall et al. (2025) illustrate the use of systematic review methods to evaluate jet-fuel health evidence, while the military pilot fatigue review by Alzahrani et al. (2025) demonstrates how operational countermeasures can be evaluated against cognitive and safety outcomes. The lesson for Nigeria is not that all US interventions can be transferred unchanged, but that occupational decisions should be documented, exposure categories defined and uncertainty stated transparently.

European and British military research offers examples of task-specific heat and load-carriage evaluation. Waldock et al. (2026) measured thermal demands during a British military fitness test, and Stegerhoek et al. (2024) integrated evidence from multiple countries in a broad review of military and law-enforcement health risks. The international rehabilitation review by Orr et al. (2025) also supports job-specific rehabilitation and return-to-duty evaluation. These approaches can be adapted to Nigerian training centres by measuring local conditions, involving personnel in equipment assessment and evaluating whether controls reduce symptoms and injury.

Canadian armoured-vehicle research shows the value of direct measurement inside the crew compartment rather than inferring exposure from general vehicle data (Nakashima et al., 2007; van Besouw et al., 2024). For Nigeria, the priority should be to create a national evidence base using representative aircraft, vehicles, bases, trades and operational settings. A small number of local pilot studies could measure noise, vibration, heat, fuel-handling practices, sleep and musculoskeletal symptoms. Results could then guide procurement specifications, maintenance priorities and training.

The major difference between the Nigerian evidence base and that of some high-income militaries is not necessarily the presence or absence of hazards; it is the visibility and measurement of those hazards in published research. Nigeria should avoid assuming that low numbers of recorded occupational illnesses mean low exposure. Under-reporting, limited diagnostic access, inconsistent definitions and competing operational priorities can all obscure occupational disease. At the same time, foreign prevalence estimates should not be presented as Nigerian rates. Local surveillance and transparent methods are necessary to determine the actual burden.

Nigerian Armed Forces and online listed Medical institutions, Facilities and Services

Table 1: focuses on facilities with identifiable institutional records. We have separated hospital capacity, such as bed numbers, from service capacity, such as the range of clinical specialties. Where it could not be confirm a bed count, it has been explicitly stated, rather than giving an estimation in the tables.

Nigerian Army medical institutions

The Nigerian Army Medical Corps officially identifies three reference hospitals and eight divisional hospitals, alongside additional medical facilities. The service framework includes primary, secondary and tertiary healthcare. Table 1: presents only information available online on Nigeria Military- medical institution, locations, capacity and types of services

Table 1: Nigeria Military- medical institution, locations, capacity and types of services (Compiled from the internet and May require further confirmation and updates)

Medical institution	Location	Capacity / level	Types of services
44 Nigerian Army Reference Hospital	Kaduna, Kaduna State	Reference hospital; tertiary care. Exact bed capacity not verified.	Specialist clinical care, surgery, medical consultations, patient management, teaching and medical research.
68 Nigerian Army Reference Hospital	Yaba, Lagos State	Tertiary reference hospital. Exact bed capacity not verified.	Surgery, internal medicine, obstetrics and gynaecology, paediatrics, psychiatry, ophthalmology, ENT, dentistry, radiology, laboratory services, physiotherapy and pharmacy.
7 Division Medical Services Hospital	Maiduguri, Borno State	Divisional hospital; primary, secondary and some tertiary services.	Emergency care, outpatient services, surgery, maternity care, mental health, dentistry, ophthalmology, physiotherapy, radiology, laboratory and public health services.

Source: Compiled from the internet by Authours, 2026

The Army's official hospital profile identifies 68 Nigerian Army Reference Hospital Yaba as a tertiary institution with 22 departments. The 7 Division hospital's service profile explicitly identifies its emergency, outpatient, surgical, maternity and diagnostic services.

Nigerian Navy medical institutions

In Table 2: details on military medical facilities and services in the Eastern Naval Command, available online are presented (with need for confirmation)The Nigerian Navy's Reference Hospital in Calabar has an official Eastern Naval Command institutional history documenting its clinical departments and diagnostic equipment. The Port Harcourt hospital has a documented 51-bed capacity following its 2025 expansion and 2026 upgrade.

Table 2: Military medical facilities and services in the Eastern Naval Command

Medical institution	Location	Capacity / level	Types of services
Nigerian Navy Reference Hospital	Calabar, Cross River State	Reference hospital. Exact bed capacity not verified.	General outpatient care, surgery, internal medicine, obstetrics and gynaecology, paediatrics, ophthalmology, physiotherapy, dentistry, radiology, laboratory services, dialysis and public health.
Nigerian Navy Hospital	Port Harcourt, Rivers State	51-bed secondary healthcare facility; upgraded to hospital status in March 2026.	24-hour services, obstetrics and gynaecology, general surgery, orthopaedics, paediatrics, radiology, laboratory, physiotherapy, dental and eye care.
Nigerian Navy Reference Hospital	Ojo, Lagos State	Reference hospital. Exact bed capacity and detailed service list not verified.	Military hospital and reference healthcare services; detailed specialities not included because I could not independently confirm them from a primary institutional source.

Source: Compiled from the internet by Authours, 2026

The Calabar hospital's official record lists advanced imaging equipment, including MRI and CT scanning, along with dialysis and laboratory facilities.

Nigerian Air Force medical institutions

The Nigerian Air Force has an established medical service structure, including hospitals, medical centres and aeromedical support. The Air Force's official records identify the 661 Hospital in Ikeja, the 063 Hospital in Abuja and the 663 Mother & Child Hospital in Badagry (table 3).

Table 3: Nigerian Air Force medical facilities and services

Medical institution	Location	Capacity / level	Types of services
661 Nigerian Air Force Hospital	Ikeja, Lagos State	Hospital; exact bed capacity not verified.	Clinical and diagnostic care. Its laboratory has ISO 15189 accreditation; the Air Force has also documented telemedicine and family medicine residency at the facility.
063 Nigerian Air Force Hospital	Bill Clinton Drive, Abuja, FCT	Hospital; exact bed capacity not verified.	General hospital services, accident and emergency care, and dialysis. The dialysis centre has three dialysis machines.
NAF Hospital, Asokoro	Asokoro, Abuja, FCT	40-bed hospital.	Hospital-based clinical care; detailed specialty list not verified.
663 NAF Mother & Child Hospital	Badagry, Lagos State	Mother-and-child hospital. Exact bed capacity not verified.	Maternal and child healthcare. Detailed clinical services and capacity not independently confirmed.

461 Nigerian Air Force Hospital	Kaduna, Kaduna State	Hospital; exact bed capacity not verified.	General medical care and referral for critical cases.
345 Aeromedical Hospital	Mando, Kaduna State	Aeromedical hospital; exact bed capacity not verified.	Aeromedical and military medical support. Detailed specialty services not independently confirmed.

Source: Compiled from the internet by Authours, 2026

The 661 hospital's laboratory accreditation is documented by the Air Force and the Medical Laboratory Science Council of Nigeria. The Abuja dialysis centre and 40-bed Asokoro hospital are documented in official Air Force announcements. Table 4: presents a comparative summary of medical services across the Army, Navy and Airforce (may require confirmation and updates to improve level of accuracy of data, where necessary, since authours were not at any time members of the armed forces and information were obtained from on-online literature on websites. These medical facilities are valuable in occupational health and trauma management.

Table 4: Comparative summary

Service	Nigerian Army	Nigerian Navy	Nigerian Air Force
Primary healthcare	Medical reception stations and medical centres	Medical centres and sickbays	Medical centres and base hospitals
Secondary healthcare	Divisional hospitals	Navy hospitals	NAF hospitals
Tertiary healthcare	Reference hospitals	Reference hospitals	Reference hospitals
Emergency and trauma care	Documented at Army hospitals	Documented at Navy hospitals	Documented at NAF hospitals
Specialist surgery	Reference and divisional hospitals	Reference hospitals	Selected hospitals
Maternal and child health	Obstetrics, gynaecology and paediatrics at reference hospital	Obstetrics, gynaecology and paediatrics at Calabar	Mother-and-child hospital at Badagry
Diagnostic services	Radiology and laboratory services	MRI, CT, radiology and laboratory services at Calabar	Diagnostic laboratories and dialysis at selected hospitals
Aeromedical evacuation	Joint military medical support	Not specifically confirmed here	Documented aeromedical evacuation training and capability

Source: Compiled from the internet by Authours, 2026

Further insights into this analysis is provided in Table 5, which provides further information on the Principal hazards and priority controls by military occupational group, while Table 6: highlights details on transferable international evidence and its relevance to Nigeria.

Table 5: Principal hazards and priority controls by military occupational group

Occupational group	Principal hazards	Priority OHS measures
Air Force: aircrew and ground personnel	Fatigue, circadian disruption, aircraft noise, vibration, jet fuel, exhaust, solvents, fire and manual handling	Fatigue-risk management; noise monitoring and audiometry; safe fuel handling; ventilation; task-specific PPE; maintenance and exposure records
Infantry	Load carriage, musculoskeletal injury, heat illness, blast/ballistic injury, falls, sleep disruption and psychological trauma	Progressive load training; equipment fit; work-rest and acclimatisation; hydration and cooling; injury reporting; confidential mental-health and post-deployment care
Mechanised/armoured crews	High noise, whole-body vibration, heat, fumes, constrained posture, communication difficulties and restricted egress	In-vehicle noise/vibration measurement; seat and suspension maintenance; ventilation and exhaust checks; compatible hearing protection; heat controls; emergency egress drills

Source: Part of recommendations by Authors, 2026

Table 6: Transferable international evidence and its relevance to Nigeria

Evidence source / setting	Key contribution	Cautious application in Nigeria
United States: jet-fuel systematic review (Vincent-Hall et al., 2025)	Systematic assessment of 28 epidemiological studies; evidence remains limited for several outcomes	Use precautionary controls and build local exposure records; do not overstate causal certainty
United Kingdom: military fitness-test thermal study (Waldock et al., 2026)	Shows that load-carriage activity can produce substantial thermal strain in recruits	Measure heat and workload under Nigerian climatic and training conditions
Canada: armoured-vehicle noise and vibration (Nakashima et al., 2007)	Demonstrates large differences by vehicle platform, crew position and terrain	Measure actual Nigerian platforms and duty cycles rather than importing foreign exposure values
International umbrella review (Stegerhoek et al., 2024)	Maps multiple health outcomes and risk factors across 43 countries	Use as a framework for a national military OHS surveillance system
Nigeria: deployed soldiers and Air Force personnel (Umeh et al., 2024; Akinlose et al., 2026; Salihu et al., 2026)	Provides locally relevant evidence on psychological distress and psychiatric morbidity	Expand beyond single-site or cross-sectional studies with representative longitudinal research

Source: Compiled by Authors, 2026

Recommendations

These recommendations include prevention framework for the Nigerian military. First, each service should maintain an occupational risk register organised by trade, task, location and exposure pathway. The register should cover aircraft operations and maintenance, fuel handling, infantry training and deployment, armoured vehicle operation, weapons training, medical support and logistics. Risk assessments should be reviewed after equipment changes, incidents, new mission profiles or significant changes in climate and workload. Second, the services should strengthen occupational hygiene and medical surveillance. Priority measures include noise mapping and audiometry, vibration assessment, heat-stress monitoring, chemical exposure documentation, respiratory and skin symptom surveillance where indicated, musculoskeletal injury tracking, sleep and fatigue screening, and confidential mental-health support. Data collection must protect medical confidentiality while allowing aggregate trends to inform prevention. Screening without access to follow-up care is unlikely to be sufficient.

Third, procurement and maintenance should include human-factors criteria. Protective equipment should be evaluated for fit, weight, thermal burden, mobility, compatibility with communications and suitability for the intended task. Aircraft and vehicle maintenance programmes should consider exposure control as well as mechanical reliability. Armoured crew seats, ventilation, acoustic conditions and emergency egress should be assessed under realistic operating conditions.

Fourth, commanders and supervisors should receive practical OHS training appropriate to their units. They should be able to identify high-risk work, recognise early signs of heat illness and fatigue, report defects, preserve incident evidence and activate emergency response. The training should emphasise that prevention is a command responsibility supported by technical specialists, not an administrative function delegated solely to safety officers. Notably, Table 5 presents useful information on principal hazards and priority controls by military occupational group.

Finally, Nigeria needs a collaborative military OHS research programme involving service medical departments, universities, occupational hygienists, ergonomists, psychologists, engineers and epidemiologists. Priority studies include prospective follow-up of deployed personnel; representative hearing and noise surveys; measurement of jet-fuel and maintenance exposures; heat and hydration studies during training; load-carriage and musculoskeletal injury surveillance; and noise/vibration mapping in armoured vehicles. Research protocols should use standardized instruments and report sample limitations clearly so that results can be compared across units and over time.

A practical way forward is to establish role-specific risk registers, routine exposure monitoring, hearing and medical surveillance, fatigue-risk management, heat controls, fit-for-purpose protective equipment, confidential mental-health services and job-specific rehabilitation. These measures should be supported by command accountability and a sustained research partnership between the Armed Forces and Nigerian universities. The central policy objective is to prevent avoidable occupational harm while preserving the readiness, dignity and long-term health of military personnel.

Conclusion

The literature indicates that military OHS should be treated as a core component of operational capability rather than an adjunct to clinical care or accident response. Nigerian Air Force personnel, infantry soldiers and mechanized armoured crews face distinct but overlapping risks: fatigue and chemical exposure in aviation; load carriage, heat and combat trauma in infantry; and noise, vibration, heat and confinement in armoured vehicles. Psychological health and sleep cut across all three groups and can affect both wellbeing and safety-critical performance.

Recent international reviews offer a stronger evidence base for understanding military health risks, but direct Nigerian exposure data remain limited for several occupational hazards. Nigerian studies of deployed soldiers, Air Force personnel and military healthcare workers nevertheless show that psychological health and work conditions deserve systematic attention. Findings from the United States, Britain and Canada can guide methods and prevention priorities, but foreign exposure levels and prevalence estimates should not be assumed to apply to Nigerian personnel.

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