

Review Article



Literature Review: Lower Back Pain in Military Rotary Wing Pilots

Abdullah H Alshehri¹ | Abdullah M Alhaznawi² | Waleed A Alshebi¹ | Saleh O Alomair¹
| Nasser A Almutlaq¹ | Abdullah M Almawash³ | Ibrahim A Albrethen¹

¹Prince Sultan Military
Medical City, Riyadh, KSA.

²Armed Forces Medical
Services, Riyadh, KSA.

³MOH, King Salman Hospital,
Riyadh, KSA.



Abstract:

Lower back pain (LBP) is a major health care challenge affecting the military aircrew worldwide. Researchers conducted studies addressing this problem to provide insight into various aspects of the illness. A comprehensive literature review was carried out on peer-reviewed sources to identify evidence-based Research on lower back pain. The analysis has shown the causes of LBP, including long flight hours, full body vibrations, and personal risk factors such as genetic health status and psychological risks. Prevention measures include physical exercise, reducing flight hours, better mental health, and cockpit and equipment redesign. Treatment options for LBP are battlefield acupuncture and exercise therapy. Additionally, lower back pain negatively impacts the lives of military pilots.

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Introduction:

Lower back pain (LBP) is prevalent in the adult population. Most people experience lower back pain at some point in their life. LBP is often used to describe discomfort or pain on the lower part of the back that may range from minor, self-limiting, or extreme to life-threatening. The pain referred may include several non-musculoskeletal or systematic pathologies such as nephrolithiasis, pancreatitis, aortic aneurysm, malignancy, and others. The challenge remains a leading cause of disability, inability to work, and poor life quality (Silva 2). A high prevalence of back pains has

been reported among members of military aircraft. The population is at risk of experiencing different types of pain due to the nature of the occupation. Numerous articles in the world literature describe pains in different segments of the spine in military pilots. Vibrations might cause lower back pain, contact and pain felt in the area of the back and the buttocks. The paper aims to review the literature on evidence already present in lower back pain in military rotary wing pilots relating to its causes, prevention, treatment, and impacts.

Causes:

A study relates the cause of lower back pain with personal and psychological risk factors among military personnel. According to Waqqash et al., personal risk factors include genetic health status, tall body height above 1.86 m, and lower

education level (164). The Research shows that other personal risk factors are smoking, alcohol use, and the general physical health of the pilot. The paper assesses the psychological risk factors and identifies high work stress, depression, sleeping disorder, and general distress to LBP in military aircrew.

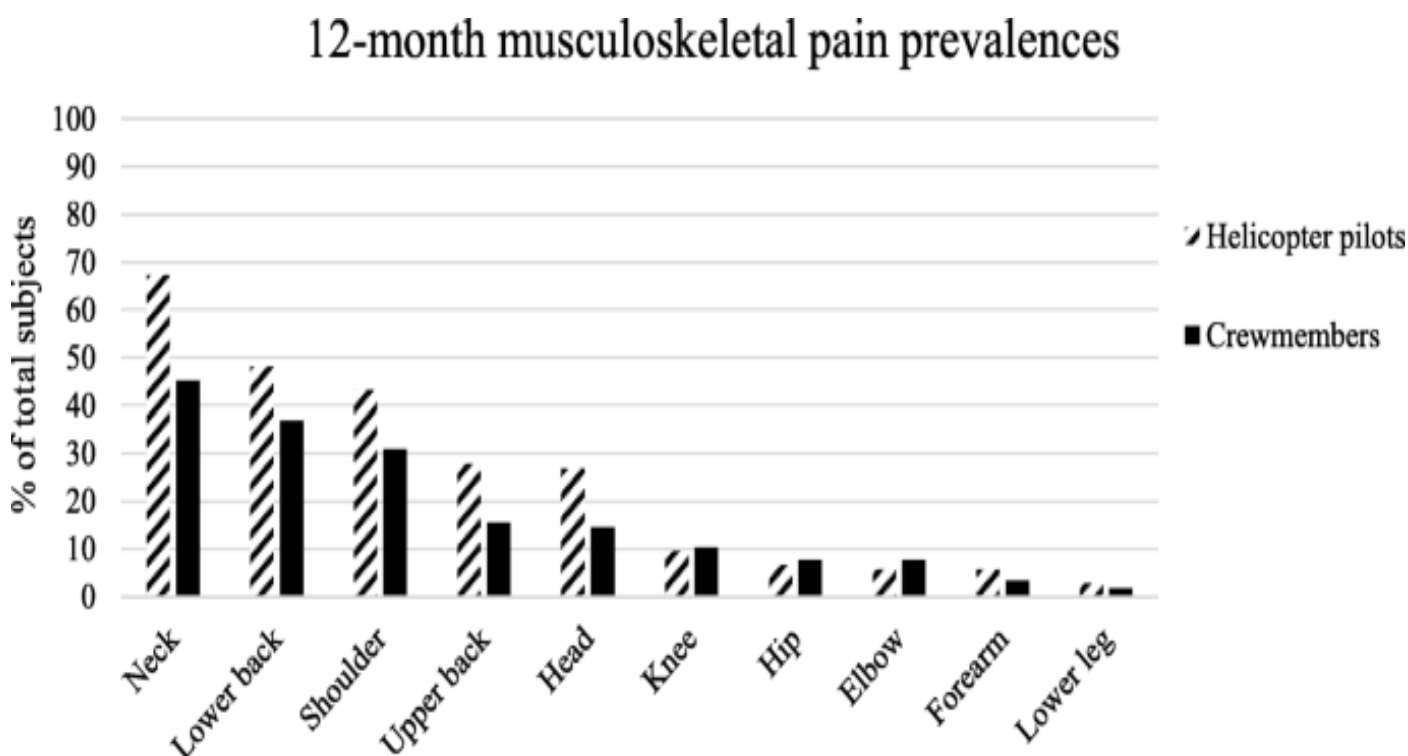


Fig1. 12- Month musculoskeletal pain prevalence (Posch et al. 6)

Age factor has been associated with lower back pain levels, earlier time of pain, and its intensity. A study by Tegern et al. with a population of 467 individuals consisting of the US army aviation crew member gathered insight on causes of LBP (101). The investigation aimed to evaluate the correlation between patterns and the relationship of factors. 84.6% of the participants reported back pain in their flying career, and 77.8% reported LBP in the last calendar year (Tegern et al. 103). The analysis found age to be significant in the correlation with earlier time to pain, higher pain ratings after the flight, and grounding occurrence.

Long flight hours may result in lower back pain in military rotary pilots. An interventional study was conducted by Mishra et al. among 25 male helicopter pilots undergoing a back and core training program (44). Questionnaires were conducted to get feedback on the causes of lower

back pain. In the evaluation, 90% of the participants felt that aircraft vibrations played a role in causing this pain, especially in frequencies ranging from 12-15 Hz (Mishra et al. 52). Different work from Silva's Research was conducted through survey and self-reported questionnaires with 106 military personnel and 91 civilians as a control group (3). The Research associated various time-in-flight factors with the causes of lower back pains in military pilots. The paper indicates that lower back pain was related to high flight hours in rotary-wing flights. The average hours of flights per week correlates with the LBP frequency.

Prevention:

Adequate physical performance levels have been found to reduce the risks of experiencing back pain disorders in military pilots. The paper by Honkanen et al. shows that the air force has used

aerobic and muscular fitness tests to evaluate physical fitness levels (697). The study concluded that high levels of fitness and axial strength in military personnel have a role in protecting pilots from experiencing spinal disorders. A work by Johnson discussed the method of addressing LBP in three categories (13). One category includes limiting flight hours to reduce the occurrence of pain. Exercise programs are another category the author advocates for to help with LBP. Cockpit and equipment redesign was suggested to improve the airframe by checking features likely to contribute to pain.

Mental health is associated with ailment and has the role of the cognitive component of pain. A cross-sectional study on 66 flight pilots related lower back pain to the psychosocial and behavioral performance of flight pilots (AlAbdulwahab et al. 27). The participants' self-efficacy was assessed in the research and the results showed that checking the patient's mental health significantly prevents LBP. Mental health promotion will be essential in preventing occupational disability and performance enhancement. Another paper reported that education of the military pilots is essential (Stevens et al. 220). Increased awareness of the challenge will help the person be always cautious and practice preventive measures. The Research indicated that education and physiotherapist-led group exercise would help prevent the reoccurrence of LBP.

Treatment:

Battlefield acupuncture is a protocol used by military personnel for pain relief. Researchers conducted a pilot feasible study on the use of battlefield acupuncture for the treatment of LBP (Fox et al. 1046). The randomized research of 15 patients demonstrated that the protocol was effective as a therapy to treat lower back pain. The data additionally suggested that the method helped improve LBP symptoms. A systematic review with meta-analysis was conducted on a cost-effective back pain treatment method. The study by Miyamoto was performed in five clinical and three electronic economic databases (179). The review showed that exercise therapy was a

significant intervention for lower back pain. The method was more cost-effective than usual care for acute lower back pain.

A home-based therapy method, morning bright light treatment, may be used for lower back pain. A treatment trial was conducted on the method to assess its impact on pain, sleep, mood, and circadian timing in veterans with LBP (Burgess et al. 776). The results showed that morning bright light treatment reduced pain intensity, improved sleep, and reduced post-traumatic stress (Burgess et al. 777). The study concluded that the method is feasible and acceptable for lower back pain treatment.

Another randomized controlled trial was carried out to investigate the effectiveness of chiropractic care on lower back pain. The paper assessed 110 military personnel with self-reported LBP (Vining et al. 254). The reports showed that chiropractic care influenced military personnel's balance, strength, and endurance. The practice consisted of spinal manipulation, advice, reassurance, and education as part of the intervention. Conclusions showed that the personnel exhibited improved balance, strength, endurance, reduced intensity in LBP, and disability.

Impacts:

The cost of lower back pain in the rotary wing exceeds the money spent on clinical care and associated medical disabilities. Lower back pain is an inconvenience that may affect performance, reduce operational effectiveness, cause occupational attrition, cause distractions, and loss of duty time. A study of 197 military pilots reported that 44.6% experienced lower back pain (Silva 5). The data shows that prevalence is high, which can affect the operation of military pilots.

Another work indicates that lower back pain prevalence is considerably high among military pilots. The longitudinal study indicated that 64.5% of the participants experienced the problem indicating a growing concern about the problem (Posch et al. 7). The data indicates that military pilots might have high effects on personal performance due to the pain need for intervention. Higher productivity would be linked to better

health of the military rotary wing pilots.

Conclusion:

In conclusion, the literature review was conducted to analyze existing information about the health problem of lower back pain in military rotary wing pilots. LBP is pain among the general adult population and is prevalent among military pilots. Numerous studies have identified the root causes of LBP, which include extended flight times, whole-body vibrations, and individual risk factors like genetic vulnerability and psychological factors. Some possible prevention strategies are exercise, fewer flight hours, improved mental health, and cockpit and equipment redesign. Treatment options for LBP are battlefield acupuncture and exercise therapy. Acting on the challenge is essential to eliminate its negative impacts on the lives of military rotary wing pilots.

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