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# Military conflicts as drivers of scientific research: pedagogy, psychology, medical science, and rehabilitation

Evgeny V. Kryukov, Vladimir A. Islamov

Kirov Military Medical Academy, Saint Petersburg, Russia

## ABSTRACT

The paper explores key areas of scientific research caused by the need to adapt to the conditions of modern armed conflicts. A particular emphasis was placed on military medicine, including the creation of mobile medical complexes, the improvement of methods for diagnosing and treating combat trauma, and the introduction of telemedicine technologies for providing immediate assistance in conflict areas. In addition, the impact of military activities on the health of servicemen was studied, including post-traumatic stress disorder, neuropsychological consequences, and methods for their correction. Scientific advances in the combat environment encompass a broad spectrum of issues, ranging from the enhancement of medical care methodologies to the development of psychological rehabilitation programs for service members and veterans. The discourse addressed strategies for the social rehabilitation of military personnel, including the integration of veterans into society, professional retraining, and psychological support. Examples of international experience in this area were presented, including the practice of stress testing and the simulation of combat conditions in military training programs. Armed conflict inevitably becomes a catalyst for scientific progress, fostering the development of technology, medicine, and psychology. In the contemporary context, scientific knowledge is adapted to address the challenges of war, leading to the development of effective mechanisms that mitigate its consequences for military personnel and civilians. An interdisciplinary approach, integrating medicine, military pedagogy, psychology, information technology, and social research, facilitates the emergence of innovative solutions that contribute to the preservation of life, health, and well-being of the population in armed conflicts.

**Keywords:** military science; military medicine; psychology of war; tactics; rehabilitation of veterans; scientific research; modern conflicts; information war.

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# Военные конфликты как драйвер научных исследований: педагогика, психология, медицина, реабилитация

Е.В. Крюков, В.А. Исламов

Военно-медицинская академия им. С.М. Кирова, Санкт-Петербург, Россия

## АННОТАЦИЯ

В статье рассматриваются ключевые направления научных исследований, вызванных необходимостью адаптации к условиям современных вооруженных конфликтов. Особое внимание уделено военной медицине, в частности созданию мобильных медицинских комплексов, совершенствованию методов диагностики и лечения боевых травм, а также внедрению технологий телемедицины для оперативного оказания помощи в зонах конфликтов. Исследуется влияние военных действий на здоровье военнослужащих, включая посттравматические стрессовые расстройства, нейропсихологические последствия и пути их коррекции. Авторы подчеркивают, что научный прогресс в условиях боевых действий охватывает широкий спектр вопросов, от совершенствования методов оказания медицинской помощи до разработки программ психологической реабилитации военнослужащих и ветеранов. Рассматриваются стратегии социальной реабилитации военнослужащих, включая интеграцию ветеранов в общество, профессиональную переподготовку и психологическую поддержку. Приводятся примеры международного опыта в данной сфере, включая тактики стресс-тестирования и моделирования боевых условий в учебных программах подготовки военных. Авторы делают вывод, что вооруженные конфликты неизменно становятся катализатором научного прогресса, стимулируя развитие технологий, медицины и психологии. В современных условиях наука не только адаптируется к вызовам войны, но и формирует эффективные механизмы минимизации ее последствий для военнослужащих и гражданского населения. Междисциплинарный подход, объединяющий медицину, военную педагогику, психологию, информационные технологии и социальные исследования, позволяет находить инновационные решения, способствующие сохранению жизни, здоровья и благополучия населения в условиях вооруженных конфликтов.

**Ключевые слова:** военная наука; военная медицина; психология войны; тактика; реабилитация ветеранов; научные исследования; современные конфликты; информационная война.

## Как цитировать

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## INTRODUCTION

Throughout human history, wars have consistently been a catalyst for scientific and technology breakthroughs. The pursuit of military superiority, efficient resource management, and adaptation to changing combat conditions has driven the development of a wide range of scientific fields. In modern conflicts, scientific progress affects everything, from weapons and equipment to tactical planning, mental training of personnel, cybersecurity, and information warfare.

According to some researchers, wars such as World War II and the Cold War have contributed to significant breakthroughs in technology, medicine, and psychology. For example, research papers on healthcare and military medicine in the World War II note that scientific approach to medical support for the army and the development of innovative evacuation methods saved 71.7% of wounded soldiers, which is an outstanding result [1].

In his 2023 and 2024 Messages to the Federal Assembly, Vladimir Putin, President of the Russian Federation, focused on the role of science and technology in ensuring the country's security and development. He emphasized that science is the "foundation of foundations" of Russia's technological advancement. In 2024, the President called for more than doubling the combined state and business investment in scientific research and development by bringing its share to 2% of GDP by 2030 for Russia to join the world's leading scientific powers\*. Such initiatives highlight the primary importance of scientific and technology advancement to strengthen Russia's defense potential and respond to modern challenges.

## MILITARY PSYCHOLOGY AND PEDAGOGY IN THE CONTEXT OF MILITARY CONFLICTS

The intricate geopolitical situation and ongoing involvement of new countries in military conflicts require a revision of conventional approaches to training and education in military educational institutions. The focus is shifting to development of adaptive techniques that can prepare personnel for action in a rapidly changing environment. Much attention is paid to mental training, development of leadership qualities and the ability to make decisions in conditions of uncertainty. Combat operations, especially in modern conflicts, often take place in an unpredictable and dynamic environment requiring the military personnel to respond quickly, remain calm, and be able to adapt to unpredictable

situations. A key aspect of such training is developing resistance to stress. For example, research in military psychology shows that military personnel who have undergone intensive psychological training show higher levels of self-control in critical situations. The USA and Israel widely use special training methods that simulate combat operations, including sudden explosions, losses, and tactical tasks in conditions of noise and visual overload.

Yanitsky's research examines effects of military conflicts on development of science in the context of global crises. The author asserts that modern wars require an interdisciplinary approach combining political, economic, social, and technological research [2]. According to Yanitsky, the Russian sociology should be instrumental in analyzing the effects of war and creating strategies for overcoming them. In his research, Yanitsky considers military conflicts as an element of hybrid warfare, including military actions and economic sanctions, information confrontation, propaganda, and cyberattacks. In such conditions, science becomes both an instrument of defense and attack and the most important driver in managing global processes. Modern wars require a comprehensive analysis as the fallouts of military operations extend far beyond military theaters. For example, armed conflicts in the 21<sup>st</sup> century (Iraq, Syria, and Ukraine) lead to energy crises, changes in international trade and financial flows, and humanitarian disasters requiring scientific consideration and solutions.

The psychological aspects of military operations are becoming increasingly important. Studies of the morale of troops, methods of psychological influence on the enemy, and methods of countering information and psychological operations are becoming a research priority. In addition, they develop psychological support programs for military personnel and their families aimed at reducing negative effects of combat stress. Military psychology as a field of scientific knowledge is actively advancing in the context of armed conflicts. Research shows that stressful situations of military conflicts shape a collective social consciousness, which influences the behavior of individuals. Carl Philipp Gottlieb von Clausewitz, cited by Lopatina in her paper, noted that fear in combat is a strongest emotion that can influence the perception of reality and decision-making [3]. Fear can disorganize and cause panic, but, if controlled, it can mobilize soldiers and strengthen the instinct for self-preservation. In this context, mental training of military personnel is of particular importance, allowing them to develop resistance to stress and the skills to make quick decisions in critical situations [4]. Thus, today's scientific development is aimed at an in-depth study of psychological factors that influence the effectiveness of combat operations and the state of society in the context of conflicts. This includes the development of methods of mental training, psychological support, and rehabilitation of military personnel and their families, which contributes to higher combat effectiveness and social stability.

\* Message of the President of the Russian Federation to the Federal Assembly dated February 29, 2024. URL: [https://www.consultant.ru/document/cons\\_doc\\_LAW\\_471111/?utm\\_source=chatgpt.com](https://www.consultant.ru/document/cons_doc_LAW_471111/?utm_source=chatgpt.com) (accessed on January 28, 2025).

## DEVELOPMENT OF MILITARY MEDICINE AND REHABILITATION

In his Messages to the Federal Assembly, Vladimir Putin, President of the Russian Federation, focused on healthcare issues, including the development of telemedicine and digital platforms for remote monitoring of individuals' health. In addition, the President highlighted the need to create special support and rehabilitation programs for participants in the special military operation and their families given the physical and psychological stress they face.

The reason is that the intensity and nature of modern conflicts lead to new types of injuries and diseases, which calls for development of innovative methods of diagnosis, treatment, and rehabilitation. The influence of the war on the advancement of medicine is noted in works on Soviet military medicine, where it is emphasized that the scientific approach to medical evacuation and development of new methods of treating the wounded contributed to saving the lives of thousands of soldiers [1].

Today, in the context of the special military operation, the development of mobile medical complexes and the improvement of methods for treating injuries continues. Development of telemedicine and mobile medical complexes allow to provide professional medical care in remote regions. In addition, there is ongoing research aimed at preventing and treating post-traumatic stress disorders. Deryabin's research of the development of military medicine in the information society of the 21<sup>st</sup> century considers the approaches to differentiation of military medicine and individual branches developing individual theories and practical applications. The author emphasizes the need to integrate information technologies in the medical support of troops as they facilitate improvement of diagnosis and treatment of injuries in combat environment [5].

In turn, rehabilitation and social adaptation of participants in military conflicts require a comprehensive approach that combines the achievements of medicine, psychology, and social sciences. Programs for professional retraining, psychological support, and medical supervision are developed. Particular attention is paid to creating communities of combat veterans that help them socialize and provide a platform for sharing experiences and peer support. In addition, research is conducted to identify and overcome the barriers that combat veterans face when returning to civilian life. The study "Impact of Russian-Ukrainian Military Actions on the Psychological State of Individuals" dwells on the need to develop new methods of mental health rehabilitation for military personnel returning from the conflict zone [3]. In addition to research on the mental health rehabilitation of military personnel,

considerable attention is paid to the physical rehabilitation of disabled participants in military conflicts. These studies are aimed at restoring physical well-being, improving the quality of life, and facilitating social adaptation of military personnel with disabilities. Thus, the study by Kolmakov, Kartavtseva, and Sostavnev highlights that the key goal of social rehabilitation programs for military personnel is to mitigate the negative consequences of social risks after injury or trauma. The authors note that physical activity both contributes to physical recovery and improves the mental health and emotional state [6]. In the study of international rehabilitation programs for combat veterans, the authors conclude that adaptive physical training and sports are an effective way of integrating people with disabilities in society and contribute to the restoration of lost functions and improvement of the quality of life [7]. In addition, research papers examine the importance of adaptive physical training as an effective component of the rehabilitation of military personnel with disabilities. It is noted that individually tailored physical exercise programs help restore locomotor functions, improve the mental health and emotional state, and accelerate the social adaptation, which, in turn, increases the combat effectiveness of this category of military personnel [8–10]. Thus, recent research of physical rehabilitation of participants in military conflicts with disabilities is aimed at integrating adaptive physical training in combat training programs.

## CONCLUSION

Today, in the context of the special military operation, research disciplines related to military medicine, pedagogy, psychology, rehabilitation, and social studies are actively developing. Understanding the consequences of the war requires an interdisciplinary approach that combines both conventional military sciences and modern disciplines such as cybersecurity, information technology, social adaptation, and medicine.

An important step in the research was the creation and registration of a scientific and practical online publication *Humanitarian Military Journal* designed to unite researchers, practitioners, and military experts. The Journal is a forum for discussing urgent issues, sharing scientific knowledge, and developing strategies for solving problems occurring in combat situations.

Thus, scientific advancement in military conflicts covers many areas from tactics and strategy of military operations to medicine, psychology, and social adaptation. An integrated approach to studying these issues will increase the effectiveness of military science and minimize the negative consequences of conflicts by contributing to restoration of society and its sustainable development in the post-war period.

## ADDITIONAL INFO

**Author contributions:** All authors made a substantial contribution to study conceptualization, data acquisition, analysis, and interpretation, writing the draft and its review, final approval of the version to be published, and agree to be accountable for all aspects of the study. Personal contribution of each author: E.V. Kryukov: conceptualization, manuscript structure; V.A. Islamov: analysis and synthesis of references, writing and formatting the manuscript.

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## AUTHORS INFO

**Evgeny V. Kryukov**, MD, Dr. Sci. (Medicine), Professor, Academician of the Russian Academy of Sciences; eLibrary SPIN: 3900-3441; ORCID: 0000-0002-8396-1936; e-mail: vmeda-na@mail.ru

**\*Vladimir A. Islamov**, Dr. Sci. (Pedagogy), Associate Professor; eLibrary SPIN: 4685-1472; ORCID: 0009-0003-5615-8835; address: 6Zh Akademika Lebedeva st., Saint Petersburg, 194044, Russia; e-mail: isvdv@mail.ru

## ОБ АВТОРАХ

**Евгений Владимирович Крюков**, д-р мед. наук, профессор, академик РАН; eLibrary SPIN: 3900-3441; ORCID: 0000-0002-8396-1936; e-mail: vmeda-na@mail.ru

**\*Владимир Александрович Исламов**, д-р пед. наук, доцент; eLibrary SPIN: 4685-1472; ORCID: 0009-0003-5615-8835; адрес: Россия, 194044, Санкт-Петербург, ул. Академика Лебедева, д. 6Ж; e-mail: isvdv@mail.ru

\* Corresponding author / Автор, ответственный за переписку