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Sledge Hockey in the System of Comprehensive Rehabilitation for Combat Veterans: Regional Experience of Zabaykalsky Krai

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Abstract: This study presents a qualitative case analysis (case study) aimed at a multidimensional assessment of the implementation of sledge hockey as a means of comprehensive rehabilitation for combat veterans in the Zabaykalsky Krai. The relevance of the work is determined by the need to develop effective models of post-traumatic rehabilitation. The research aims to analyze regional practice, identify key mechanisms, the rehabilitation potential of the sports discipline, and formulate prospects for its development. We used historical-logical and systematic analysis of literature, content analysis of documents and open sources (2024–2025), as well as generalization of data obtained during semi-structured interviews and observations of a pilot group of veterans ($n = 12$). As a result, we describe and analyze a tripartite organizational model ensuring end-to-end support for participants. A specific hierarchy of veterans' motivation was identified, dominated by motives for physical recovery, increased physical activity, and social reintegration. The discussion of results emphasizes that sledge hockey acts as an effective tool for simultaneous impact on the physical condition, psycho-emotional sphere, and social capital of veterans. In conclusion, we substantiate the necessity of transitioning from describing practices to their scientific and methodological support, including the development of adapted training protocols considering the polymorphic nature of the contingent, the introduction of elements of biomechanical monitoring, and the use of modern motion analysis technologies for injury prevention. The experience of the Zabaykalsky Krai demonstrates the high feasibility and replicable potential of developing comprehensive rehabilitation through adaptive sports in other regions of the Russian Federation.

Keywords: Sledge Hockey; Rehabilitation; Combat Veterans; Adaptive Sport; Zabaykalsky Krai; Physical Training; Social Integration; Qualitative Research

1. Introduction

Comprehensive rehabilitation of persons with combat-related disabilities is among the priority objectives of state social policy. The modern approach to rehabilitating veterans with traumatic injuries of the musculoskeletal system (MS), in particular, with consequences of lower limb amputations, has moved far beyond prosthetics and medical care, integrating psychosocial and activity-based components [1,2]. According to international studies, receiving a severe wound is associated not only with long-term physical limitations but also with a complex of psychological problems, including post-traumatic stress, depression, anxiety, and loss of social identity, which together sharply reduce the quality of life [3,4].

In this context, adaptive physical culture and sports (AFCS) have established themselves in global practice as integral elements of rehabilitation programs, proven to be effective in improving functional capabilities, psycho-

emotional state, and promoting social reintegration [5,6]. However, the effectiveness of integrating adaptive sports into the rehabilitation system directly depends on the scientific validity of the applied methods, considering both the specifics of the nosology and the biomechanical features of a particular sports discipline. The modern paradigm of sports rehabilitation emphasizes the critical role of biomechanics not only in optimizing sports results but also in minimizing the risks of secondary injuries, as well as in individualizing the training process at the recovery stage [7]. Thus, the introduction of any adaptive sport into rehabilitation practice requires a thorough analysis of its ergonomic requirements and potential loads on the body, considering the specifics of the injuries of the target group.

Historically, the need for effective models of military personnel rehabilitation intensifies during periods of large-scale conflicts. In this study, the focus is on combat veterans who have received severe wounds, in the context of the current socio-political reality of Russia. This is due to the emergence of an urgent need for the development and testing of comprehensive interdisciplinary recovery programs. Traditional methods of medical rehabilitation, while remaining a fundamental foundation, often prove insufficient for solving the problems of psychological adaptation and social restoration of the individual, and gaining a new life perspective [8,9].

Dynamic team adaptive sports, such as sledge hockey (sled hockey), acquire particular significance in this light. Sledge hockey is a complex-coordination activity that places high demands on anaerobic and aerobic performance, strength endurance of the upper shoulder girdle, as well as cognitive functions (tactical thinking, speed of decision-making). Its rehabilitation potential stems from the synergy of several factors: intense physical load, competitive excitement, team interaction, and the formation of a new, positive identity (“athlete” instead of “disabled person”). In Russia, sledge hockey, officially developing since 2009 and having achieved significant international success, has been actively positioned in recent years as an effective means of rehabilitating wounded military personnel [10].

However, the process of implementing and scientifically substantiating such programs has a pronounced regional character and requires detailed study. Zabaykalsky Krai in this case acts as a representative model for research. With the active participation of the regional branch of the “Defenders of the Fatherland” Foundation, a program for the systemic involvement of combat veterans in sledge hockey was initiated and implemented here. Studying this model allows for identifying key organizational, logistical, and socio-psychological mechanisms for integrating sports into rehabilitation practice, as well as assessing emerging challenges and limitations.

The purpose of this study is to conduct a multifaceted qualitative analysis of the regional model of implementing sledge hockey as a means of comprehensive rehabilitation for combat veterans in Zabaykalsky Krai. Unlike a declarative-descriptive approach, this work aims to consider the practice through the prism of modern scientific concepts of the biomechanics of adaptive sports, principles of building a training process for persons with consequences of MS injuries, and mechanisms of motivation for physical activity in the post-traumatic period.

Materials and Methods

This study is a qualitative analysis of a single case (case study) using descriptive data analysis. The choice of qualitative methodology is due to the pilot nature of sledge hockey implementation in the region and the goal of a deep, contextual understanding of the emerging practice, its mechanisms and the meanings invested in it by the participants, which corresponds to the canons of qualitative research in the field of social rehabilitation and sports science [11,12]. The work included several complementary stages of data collection and analysis.

The target group of the study was formed by quota sampling and included 12 ($n = 12$) combat veterans – members of the first sledge hockey team “Kodar” in Zabaykalsky Krai. The small sample size is adequate and informative for the tasks of qualitative research aimed not at statistical generalization, but at obtaining a detailed, rich description and identifying typical patterns of experience within a specific group [13]. All participants (12 men aged 25 to 45) had disabilities due to injuries and amputations of the lower limbs received between 2022 and 2024.

To achieve the goal, a set of methods ensuring data triangulation was applied:

1. Historical-logical and systematic analysis of scientific and methodological literature. Conducted to study the genesis of sledge hockey, systematize the principles of physical and technical-tactical training, as well as to integrate modern data from sports biomechanics and rehabilitation science into the theoretical basis of the work. Special attention was paid to the search for publications devoted to the specifics of loads on the upper shoulder girdle in adaptive sports, methods of assessing functional state, and principles of individualizing the

training process for persons with consequences of MS injuries [7,14,15].

2. Content analysis of documents and open sources. The following were analyzed:
 - Official rules of the Russian Sledge Hockey Federation and methodological manuals for athlete training [10].
 - Public reports, press releases, and news materials from the “Defenders of the Fatherland” Foundation (federal and regional levels) for 2024–2025.
 - Publications in federal and regional media (TASS, Gazeta.Ru, the press service of the Government of Zabaykalsky Krai) devoted to the development of sledge hockey and veteran rehabilitation. These sources were used exclusively for reconstructing the chronology of events, describing infrastructural and organizational aspects, and not as an evidence base for physiological or psychological claims.
3. Semi-structured interviews and participant observation (qualitative methods). To collect primary empirical data on motivation, experience, and perception of the rehabilitation process, in-depth semi-structured interviews were conducted with 8 participants of the “Kodar” team (duration 30–50 min). Interviews focused on topics: injury and rehabilitation history, motives for starting classes, subjective perception of physical and psychological changes, experience of team interaction. The qualitative data analysis procedure included transcribing interviews, coding texts with the allocation of semantic units, their categorization, and subsequent interpretation to build a generalized picture (analytic induction) [16]. The ranking of motives in **Table 1** was performed based on the frequency and semantic richness of the corresponding statements of respondents.
4. Comparative and generalizing analysis. The obtained qualitative data and findings from the document analysis were systematized and correlated with federal trends, as well as with the theoretical foundations outlined in the scientific literature.

Table 1. Ranking of Motives for Engaging in Sledge Hockey among Combat Veterans in Zabaykalsky Krai (Based on Qualitative Analysis of Interviews, n = 12).

Rank	Key Motive	Substantive Characterization (Based on the Statements of the Respondents)
1	Physical rehabilitation and health improvement	The desire to restore functional capacities of the body, strengthen the muscular framework, increase overall tone, and improve physical fitness (“...began playing to recover after the injury...”, “... I feel my arms and back getting stronger...”).
2	Increase in motor activity and overcoming forced hypodynamia	A motive particularly relevant for veterans who spent long periods undergoing inpatient and outpatient treatment. Ice training is perceived as a way to break out of confined space and routine (“...wanted to feel the speed, the movement...”, “...out there you forget all about the crutches, the wheelchair...”).
3	Psychological relief and emotional recovery	The desire to relax, distract oneself, relieve psycho-emotional tension, and obtain positive emotions. Dynamic play serves as a powerful means of emotional regulation (“...this is the best way of keeping depressing thoughts away...”, “...when training, I feel like I’m overflowing with positive energy...”).
4	Social reintegration and communication	The desire to form new social bonds, acquire a new environment, and regain a sense of the lost army fraternity (“...here, I met people that understand me without me having to say a single word...”, “...the team is like a family to me...”).
5	Regaining a sense of usefulness and personal significance	A motive associated with the desire to feel needed and valued within a new activity such as a sports team. Attention from authorities and society reinforces this motivation (“...makes you feel like you’re worth something, you’re your team needs you...”, “...it’s great to be seen and appreciated...”).
6	Sporting excitement and achievement orientation	The desire to demonstrate abilities in conditions of healthy competition and to achieve sporting results. Tournament participation serves as a key activator (“...I want to win, I want our team go above and beyond...”, “...there’s this thrill, the desire to get even stronger, even better...”).
7	Formation of a new life perspective and identity	Sport participation facilitates the construction of a post-traumatic identity, shifting focus from limitations to new opportunities (“...sledge hockey gave me a new purpose in life...”, “...now that I’m an athlete, I don’t feel as restricted by the disabled label anymore...”).

The main limitation is related to the research design: as a qualitative case study, this work does not claim representativeness and does not allow establishing statistically significant cause-and-effect relationships. Its task is to show feasibility, describe mechanisms, and put forward substantiated hypotheses for subsequent quantitative testing in longitudinal or comparative studies with a larger sample and the use of validated psychometric and physiological tools.

The study was conducted in compliance with ethical standards. All interview participants were informed about the research objectives, and anonymity and confidentiality of their personal data were guaranteed. Oral informed consent was obtained before each conversation.

2. Theoretical, Methodological, and Biomechanical Foundations of Sledge Hockey as a Rehabilitation Discipline

2.1. Specifics of Sports Activity and Its Rehabilitation Potential

Sledge hockey, being an adaptive version of ice hockey, is a high-intensity team game, the unique ergonomics of which determine its high rehabilitation value for individuals with lower limb impairments. Athletes move on specially designed sledges, pushing off the ice with two sticks, one side of which is equipped with metal teeth, and the other has a blade for handling the puck. These basic mechanics form a set of requirements: the need for simultaneous realization of locomotion (pushing) and manipulation of the sports equipment (dribbling, passing, shooting) under conditions of a low center of gravity and limited stability. Game shifts in sledge hockey, as shown by timing data, last longer than those in traditional hockey (on average 70–90 s), which places exceptional demands on anaerobic glycolytic performance and strength endurance of the muscles of the upper half of the body [10].

From the point of view of biomechanics and rehabilitation load, sledge hockey represents a model of cyclic-acyclic activity with a pronounced strength component. The key rehabilitation aspect is the intense load on the upper shoulder girdle, core and back muscles, which contributes to the restoration and strengthening of the transverse abdominis muscle, critically important for compensating for the functions of lost or damaged lower limbs. However, this same specificity gives rise to certain risks. Repetitive unidirectional pushing movements create pre-conditions for the development of muscle imbalance and asymmetry in the shoulder girdle, which can lead to over-strain of the joint-ligament apparatus, tendinopathy of the rotator cuff [14,17]. Thus, building a training process for novice veterans should not simply copy the practices of elite sports, but be based on preliminary functional testing and include compensatory exercises to prevent such imbalances.

2.2. Athlete Classification and Its Correspondence to the Nosological Profile of Veterans

The classification system in sledge hockey, regulated by the International Paralympic Committee, aims to ensure the principle of fair competition and is based on assessing the minimum degree of lower limb impairment. Individuals with amputation at the ankle joint level and above, paresis, ankylosis of major lower limb joints, spasticity, or a leg length difference of at least 7 cm are allowed to compete [10]. These criteria largely overlap with the spectrum of the most common injuries received by combat veterans as a result of mine-explosive injuries and gunshot wounds, making this sport potentially accessible and relevant for the target group. It is important to note that classification is a tool for forming competitive groups; however, in rehabilitation practice, it is not so much the formal class of the athlete that comes to the fore, but an individual assessment of their functional capabilities, residual muscle strength, proprioception, and mobility for developing a personalized training program.

2.3. System of Physical Training and Basics of Its Individualization for Rehabilitation Purposes

The generalized system of physical training in sledge hockey, described in the methodological literature, includes several interrelated modules: strength training, development of endurance, speed, agility (coordination), and flexibility [10]. For the purposes of scientific analysis and subsequent adaptation to rehabilitation practice, this general plan requires significant detailing and methodological justification.

The emphasis on the development of “actual strength abilities” of the upper shoulder girdle, back, and core is justified. However, objective starting points are needed for safe and effective load dosing. In the context of working with veterans, many of whom are at the initial stages of recovery after prolonged hypodynamia, standard protocols for determining one-repetition maximum (1 RM) in basic exercises (e.g., bench press, rows) may be unsafe or difficult to perform. In this case, it is advisable to use scientifically validated methods of indirect prediction of 1 RM based on performing a submaximal number of repetitions with a known weight, which are adapted for various contingencies and exercises [18]. This allows establishing individual training zones for strength and hypertrophy development with sufficient accuracy, minimizing risks. It seems extremely important to include isokinetic testing and correction of ratios of antagonist muscle pairs of the shoulder joint (e.g., the ratio of rotator cuff strength) in the strength block. Specific training aimed at correcting such an imbalance has been proven to reduce the risk of shoulder injuries in athletes whose activity is associated with repetitive overhead movements and pushing [17].

Endurance development is crucial. It should combine aerobic loads (to improve general cardiorespiratory fitness and recovery speed) and high-intensity interval training (HIIT), as close as possible in duration and nature

of energy supply to a game shift (45–90 s of high-intensity work). For veterans with concomitant cardiovascular risks or consequences of polytrauma, preliminary medical and functional testing with determination of individual heart rate zones and oxygen consumption levels is mandatory.

Speed and agility, or coordination abilities, are of paramount importance for rehabilitation, as they are directly related to the restoration of proprioception, sense of balance in an unstable position, and spatial orientation. Training should include maneuvering exercises, obstacle slaloms, quick stick interception, which stimulates neuromuscular control and cognitive functions. The use of biomechanical analysis technologies (e.g., motion capture systems) could allow objective assessment of progress in movement technique and pushing efficiency, providing feedback to the coach and athlete for movement correction [7].

3. Federal Context of Sledge Hockey Development as a Tool for Veteran Rehabilitation

The development of sledge hockey as a means of rehabilitating combat veterans in Russia is systemic and purposeful, initiated at the highest state level. This process can be characterized as the formation of a nationwide rehabilitation-sports movement, in which the sports component is inextricably linked with the tasks of social policy. The key coordinating and resource role in this process is played by the Defenders of the Fatherland Foundation, which, according to its public reports, operates on the instruction of the President of the Russian Federation and with the support of the Ministry of Defense [19].

The main markers of the movement's development at the federal level are:

- Territorial expansion: As of March 2025, veteran sledge hockey teams were created in 15 regions of Russia, and more than 300 veterans from 60 regions of the country participated in events for the development of this direction in Khanty-Mansiysk [19]. This indicates rapid scaling of the practice.
- Institutionalization through competitive activity: In 2024–2025, a number of specialized tournaments were held (in Tula, Yaroslavl, Nizhny Novgorod), among which the Russia-wide “Heroes Cup” became key [20]. These events perform not only a sports, but also a powerful socio-rehabilitative function, creating a unified semantic field for veterans from different regions, an environment for exchanging experiences and restoring social connections in a new, “civil-sports” capacity.
- Formation of a regulatory and methodological base: Development occurs within the framework of the existing sports classification and rules of the Russian Sledge Hockey Federation, which ensures continuity and the possibility of integrating the most successful veterans into professional Paralympic sports.

Thus, the federal context created a clear demand for regions, including Zabaykalsky Krai, provided certain resources (methodological, organizational) and outlined successful formats of activity (creating teams, participating in tournaments), which became the basis for building local models.

4. Regional Model of Rehabilitation by Means of Sledge Hockey in Zabaykalsky Krai: Structure, Implementation, and Qualitative Analysis

4.1. Organizational Structure and Interaction Mechanisms

In Zabaykalsky Krai, an effective tripartite organizational model has been formed, and it can be described as a “public-private partnership with a resource core in the form of a non-profit organization.” Its key elements:

- Resource and methodological core: Regional branch of the “Defenders of the Fatherland” Foundation. It performs the functions of the project operator: identifies and attracts veterans, organizes individual selection and purchase of expensive specialized equipment (sledges, sticks, gear), coordinates the coaches, ensures logistics for participation in away competitions [20].
- Infrastructural and political support: State authorities of Zabaykalsky Krai (represented by the governor and relevant ministers). Their role is to create the necessary conditions: providing preferential access to the ice arena, resolving administrative issues, organizing meetings with veterans, which increases the social status of the project and its participants [21].
- Executive link: Professional coaching staff and sports institutions ensuring regular training process based on existing sports infrastructure (Ice Palace in Chita).

This model provides end-to-end support for the veteran: from the moment of attraction and primary motivation to integration into the sports community. A vivid example of the effectiveness of this work was the creation of the “Kodar” team that consists of 12 veterans who had sustained severe injuries. The team was formed in April 2025, and its first training session took place on April 6, 2025, in Chita [20].

4.2. Logistical Support and Its Role in the Rehabilitation Process

A critically important aspect, directly affecting the safety, motivation, and effectiveness of classes, is the provision of personal, professional equipment. As emphasized by the head of the foundation’s branch, T. Lonshakova, “sledges are created individually for each participant, as is the equipment”. This point cannot be overestimated from clinical and biomechanical points of view. Properly selected and adjusted sledges ensure optimal position of the pelvis and spine, load distribution, which prevents the development of secondary pathologies (e.g., back pain) and allows focusing on technique and physical load. Personalization of equipment is a mandatory condition for the transition from simple motor activity to purposeful sports-rehabilitation practice.

4.3. Competitive Activity as an Integrative Rehabilitation Component

The participation of the “Kodar” team in the Russia-wide tournament “Heroes Cup” in Tula in August 2025 became the culminating event of the first stage of the program’s implementation [19]. Competitive activity within this model acts not as an end in itself, but as a powerful catalyst and tool of rehabilitation, realizing several functions:

- Goal setting and structuring of time: Preparation for a specific tournament sets a clear temporal rhythm to the training process, turning it from a set of disparate activities into purposeful activity.
- Objectification of progress: Competition is an examination of acquired skills, strength, endurance, and tactical understanding, that gives veterans objective (though subjectively experienced) feedback on their progress.
- Social legitimization and expansion of identity: Traveling to the Russia-wide level, competing with teams from other regions legitimizes the new status of veterans as athletes in their own eyes and in the eyes of society. It is important to note that the previous experience of Zabaykalsky veterans’ participation in other adaptive competitions (“Cup of Defenders of the Fatherland” in Khabarovsk, June 2024) played the role of an important “preparatory step”, forming a basic competitive culture and confidence necessary for transitioning to a more complex and dynamic discipline [20].

4.4. Analysis of the Motivational Sphere of Veterans Involved in the Sledge Hockey Program

The conducted qualitative analysis of interview data revealed a hierarchical structure of motives prompting veterans to engage in sledge hockey. Ranking was performed based on the frequency and semantic richness of the corresponding statements in transcripts (method of qualitative content analysis). The obtained results (**Table 1**) reflect the complex needs characteristic of individuals at the stage of active socio-psychological reintegration after a severe injury.

The revealed hierarchy demonstrates a synthesis of basic rehabilitation needs (ranks 1–3) and needs of a higher order related to social high position of motives of social integration and sports excitement, which distinguishes this group from veterans at the initial, inpatient stages of rehabilitation, where motives of health exclusively dominate [22]. This indicates that sledge hockey, as a long-term team practice, effectively actualizes and satisfies needs for affiliation, achievement, and self-affirmation, which is critically important for full reintegration into society.

4.5. Interrelation of Motivation, Level of Awareness, and Effectiveness of the Rehabilitation Process

In accordance with theoretical concepts that sustained motivation for physical activity correlates with the level of knowledge about its principles and effects [22], the cognitive interest of the program participants was analyzed. The data summarized in **Table 2** are based on the answers of veterans during interviews and informal conversations at the beginning of the program (April 2025) and after four months of systematic training (August 2025). The observed dynamics illustrate the educational function of the sports-rehabilitation program.

Table 2. Dynamics of Awareness among Combat Veterans—Participants of the Sledge Hockey Program (n = 12).

The Awareness Aspect	At the Beginning of the Program (April 2025)	After Four Months of Training (August 2025)	Comment
Understanding the fundamentals of physical training in sledge hockey	2/12 people: had a basic understanding	11/12 people: can explain the key principles of strength, speed, and coordination training	Regular training sessions stimulated interest in the methodological foundations of the training process
Knowledge of the Paralympic movement and the classification system	3/12 people	12/12 people	Participation in the competition system required understanding of rules and regulations
Awareness of the impact of training on the specific body functions	Low level of awareness, vague wording (“to be healthier”)	High level of awareness, specific wording (“to develop strength endurance of the shoulder girdle”, “to improve proprioception”)	Practical experience led to a conscious understanding of the goals of loads
Desire to deepen knowledge in the field of adaptive physical culture and sport therapy	5/12 people expressed passive interest	10/12 people showed active interest, asked questions to coaches and doctors	Cognitive motivation formed as part of the overall sports motivation

As seen from the table, systematic training led to a significant increase in veterans’ awareness in matters directly related to their recovery and sports activity. Practical experience formed a “demand” for theoretical justification, which, in turn, contributes to the transition from external motivation (doctor’s recommendation, foundation’s offer) to internal, based on personal interest and conscious goal-setting. This educational effect is an important additional result of the program, increasing the biomedical literacy of participants and their ability to manage their health independently in the long term.

5. Discussion

The conducted qualitative analysis of the regional practice of Zabaykalsky Krai allows us to assert that the introduction of sledge hockey into the system of rehabilitation of combat veterans represents a multifaceted and viable model, the potential of which is based on the synergy of organizational solutions, the specifics of the sports discipline, and social demand. Unlike narrowly specialized medical procedures, this model implements a holistic approach, simultaneously impacting the biological, psychological, and social levels of personality functioning. However, the obtained data also highlight a number of methodological challenges and growth areas requiring the integration of modern scientific knowledge to transition from a successful pilot project to a sustainable, scientifically based regional program.

1. Synergy of the organizational model. A key factor in the success of the initiative was the creation of a functional tripartite cooperation (foundation–regional authority–sports institutions). This structure effectively compensates for typical problems of fragmentation in the social sphere: the foundation, having a mandate and resources, acts as a flexible operator and a “social elevator” for veterans; the authority provides institutional support and access to infrastructure; sports organizations provide professional staff and a methodological environment. Such configuration corresponds to the principles of effective public-private partnership in the social sphere, where a non-profit organization takes on the risks of innovation and targeted work with the target group, and the state creates stable conditions for its scaling. It seems that the reproducibility of this organizational model in other regions will directly depend on the ability to cultivate this type of relationship, adapting it to local administrative and resource realities.
2. Multidimensional nature of the rehabilitative impact. Sledge hockey within the studied model demonstrated itself as a tool of polymodal impact, which fully corresponds to modern concepts of biopsychosocial rehabilitation [6].
 - Physical aspect. The intense load on the upper shoulder girdle and core muscles, necessary for movement and game actions, provides targeted development of muscle groups critical for compensating the functions of lost lower limbs and maintaining vertical stability. However, as the analysis of biomechanical features showed, this load is potentially asymmetrical and traumatic [14,17]. Consequently, the key task at the next stage is not just stating the positive effect, but developing and implementing compensatory protocols into the training process aimed at preventing imbalances and overstrain. This requires the involvement of specialists in sports medicine and biomechanics, as well as the use of objective as-

assessment methods, such as isokinetic testing, to monitor the condition of shoulder rotator muscles and timely correction of training plans [17].

- Psychological aspect. Interview and observation data convincingly indicate that the dynamic team game serves as a powerful means of emotional regulation, distraction from traumatic experiences, and formation of a new, activity-based identity. The path from doubts (“we won’t make it”) to achieving mastery (“everything works out”) is a classic narrative practice of overcoming, restructuring self-esteem and the sense of control over one’s own life [23]. In this context, sledge hockey acts as a form of “mediated communication” and catharsis, where aggression and tension accompanying post-traumatic syndrome find a socially acceptable and structured outlet within the framework of sports confrontation.
 - Social aspect. The emergence of the “Kodar” team as a new significant social group is perhaps the strongest rehabilitation effect. The group provides veterans not only with communication but also a system of mutual obligations, common goals, and collective identity, which effectively counteract social isolation and marginalization. Participation in competitions and attention from society act as forms of symbolic recognition, restoring veterans’ sense of social significance and inclusion, lost after leaving the army system.
3. Motivational dynamics and educational effect. The identified hierarchy of motives (**Table 1**) reflects the evolution of a veteran’s needs in the rehabilitation process: from basic (physical recovery) to higher (self-realization, social integration). The high rank of motives of “social reintegration” and “sports excitement” indicates that the program successfully actualizes needs characteristic of the stage of active reintegration into society, which distinguishes it from programs focused only on physical therapy. The parallel growth in participants’ awareness (**Table 2**) demonstrates an important educational effect. Practical experience forms a conscious “demand” for knowledge, which contributes to the internalization of motivation—the transition from external stimuli (doctor’s recommendation) to internal beliefs and values related to a healthy lifestyle and sports [22]. This process is the key to long-term adherence to physical activity even after the completion of the formal rehabilitation program.
 4. Problem areas and challenges. Despite its successes, the model faces limitations typical of the region.
 - Staff shortages. There is an acute shortage of coaches possessing competencies simultaneously in the sports methodology of sledge hockey, biomechanics, and in the specifics of working with the consequences of combat injuries and psychological characteristics of veterans. It is necessary to develop and implement specialized programs of additional professional education for AFCS coaches, including modules on the basics of military psychology, traumatology, and biomechanics of adaptive sports.
 - Infrastructure barriers. Most ice arenas are not adapted for sledge hockey training (lack of wide openings in the boards for sledges, accessible locker rooms and showers, specialized gyms). This is not only an accessibility problem but also a factor limiting the regularity and quality of the training process.
 - Individualization of the training process. As rightly noted in scientific sources, a “search for new effective models of training activity in sledge hockey” is needed, taking into account the polymorphism of the veteran contingent [24]. Generalized methods of Paralympic athlete training are not always applicable to veterans at early stages of rehabilitation, who have concomitant diseases and various psychophysiological characteristics. It is necessary to develop flexible, personalized training plans based on preliminary comprehensive testing (functional, biomechanical, psychological).

The key challenge is the integration of modern technologies to overcome the indicated limitations. In particular, machine and deep learning methods are beginning to play an increasingly significant role in sports biomechanics for motion analysis, injury risk prediction, and technique optimization [25]. The application of even relatively accessible motion capture systems with video cameras and sensors would allow for objectively assessing the pushing and maneuvering technique of beginner athletes, identifying asymmetries, and giving individual recommendations. Thus, the scientific-methodological support of the rehabilitation process should include not only traditional pedagogical approaches but also elements of digital monitoring and data analysis.

5. Prospects and significance for the rehabilitation system. The experience of Zabaykalsky Krai possesses significant replicable potential and offers a solution for modernizing the system of veteran rehabilitation through adaptive sports. Further development is seen in the following directions:

- Scientific-methodological support: Development and testing of specialized standards and training programs for coaches, as well as individualized training modules for veterans with various nosologies, based on the principles of evidence-based medicine and biomechanical analysis data.
- Technological modernization: Phased supplying of sports facilities with the necessary equipment to create a barrier-free environment, as well as the introduction of biomechanical control tools (pressure force, kinematics) into the training process to minimize risks and maximize efficiency.
- Systemic monitoring: Organization of longitudinal monitoring of long-term rehabilitation results (physical indicators, psychological state, quality of life, social activity) for objective assessment of the long-term effect of programs and their constant optimization.
- Network interaction: Creation of a platform for exchanging experience between regions, including a database of best practices, methodological materials, and research results, which will accelerate the process of scientific understanding and improvement of rehabilitation models.

The implementation of the sledge hockey program in Zabaykalsky Krai represents a successful example of the practical realization of the concept of sport as rehabilitation. It demonstrates how, through the synthesis of physical activity, social interaction, and psychological support, it is possible not only to restore the functional capabilities of veterans but also to help them acquire a new sense of meaning, thereby improving their quality of life.

6. Conclusions

The conducted multifaceted qualitative study allowed for the analysis and evaluation of the regional experience of Zabaykalsky Krai in introducing sledge hockey into the system of comprehensive rehabilitation of combat veterans. This experience demonstrates high feasibility and multifunctional potential of a model based on the synthesis of adaptive sports, purposeful organizational work, and public-private partnership. Within a short period of time, the region not only managed to create a functioning team “Kodar” but also integrated it into the Russia-wide sports movement, providing participants with an opportunity for simultaneous physical, psychological, and social recovery.

The rehabilitation value of sledge hockey, as the analysis showed, stems from its high physical intensity, complex coordination nature, and team format. These characteristics were successfully actualized within the regional model, leading to a number of significant effects: targeted development of the muscular corset of the upper half of the body, necessary for compensating functions; formation of a new, positive identity of an “athlete”; creation of a supportive social community, mitigating the risks of isolation; and growth of internal, conscious motivation for a healthy lifestyle.

The study confirms that sledge hockey is a highly effective tool for the comprehensive rehabilitation of SMO (Special Military Operation) veterans, facilitating their return to social life and the acquisition of new meaning and life perspective.

However, the study also revealed key challenges requiring a transition from successful pilot practice to a sustainable, scientifically based program. These include: the need to overcome personnel deficit through specialized coach training; modernization of sports infrastructure to ensure accessibility; and, most importantly, deep individualization of the training process based on modern biomechanical knowledge and methods of assessing functional state. The integration of elements of biomechanical analysis and digital monitoring into the training process seems a necessary step for minimizing the risks of secondary injuries and optimizing loads taking into account the polymorphism of the veteran contingent.

Further development of this direction in Zabaykalsky Krai and its replication in other regions of the Russian Federation is seen in the following strategic steps:

- Development and implementation of specialized educational and methodological materials for coach training, combining competencies in the field of sports training, basics of military psychology, traumatology, and biomechanics of adaptive sports.
- Creation and testing of variable training programs based on preliminary comprehensive testing (functional, biomechanical, psychological) and considering the specifics of various types of wounds and concomitant conditions.

- Phased modernization of the material-technical base, including both adaptation of ice arenas (special openings, accessible locker rooms) and supplying with equipment for biomechanical control and strength training.
- Establishment of a system of longitudinal monitoring of the physical, psychological state, and quality of life of program participants for objective assessment of long-term rehabilitation results and evidence-based optimization of methods.
- Formation of an interregional network platform for exchanging successful practices, methodological materials, and results of scientific research in the field of adaptive sports as a means of rehabilitation.

The experience of Zabaykalsky Krai clearly confirms that sledge hockey and similar high-intensity team disciplines of adaptive sports can act as an effective core of a modern system of comprehensive rehabilitation. They open the way not only for the restoration of physical functions but also for deep psychological and social reintegration of combat veterans, contributing to the acquisition of a new life perspective and sustainable improvement in the quality of life. The implementation of the indicated prospective directions will allow transforming a successful regional initiative into a scientifically based, scalable national practice.

Author Contributions

Conceptualization, K.L. and S.K.; methodology, K.L. and S.K.; validation, K.L., S.K., and E.B.; investigation, K.L., S.K., and E.B.; resources, K.L., S.K., and E.B.; data curation, S.K.; writing—original draft preparation, K.L., S.K., and E.B.; writing—review and editing, K.L. and S.K.; visualization, K.L., S.K., and E.B.; supervision, S.K.; project administration, S.K. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article.

Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

The authors declare that no artificial intelligence (AI) tools were used in the preparation of this manuscript.

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