

The value potential of Kyrgyz national physical culture and sports: medical and psychosocial analysis

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Abstract

Objective: Kyrgyz national physical culture and traditional sports, developed in the context of a high-altitude nomadic lifestyle, represent a significant medical and social resource with significant health and adaptive potential. The current decline in physical activity among the population, especially among children and adolescents, necessitates the introduction of culturally determined forms of physical activity into public health practices. The purpose of this analytical review article is to summarize current data obtained from scientific databases on the potential of Kyrgyz national physical culture and sports from a medical and social perspective.

Methods: The study is based on an analysis of 104 domestic and international scientific sources (eLIBRARY, Google Scholar, Scopus, Web of Science, etc.) for the period 2000–2024, selected using analytical, comparative-historical, systemic, and content analysis.

Results: It is shown that national sports combine aerobic, strength, and coordination loads, contributing to the development of cardiorespiratory endurance, strengthening of the musculoskeletal system, and the prevention of metabolic disorders. Their positive impact on the psychoemotional state, stress resistance, social adaptation, and the formation of cultural identity is noted.

Conclusions: Kyrgyz national physical culture and sport are not only an element of cultural heritage but also a scientifically based tool for disease prevention and public health promotion, promising for integration into educational and health programs.

Key words: Kyrgyz national physical culture, national sports, traditional sports, values of physical culture, population health, medical and social aspect, impact on health

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Highlights

- Kyrgyz national sports can contribute to strengthening of cardiorespiratory endurance, developing the musculoskeletal system, and preventing metabolic disorders.
- Participation in collective gaming and sports practices may be associated with the development of emotional regulation, stress resilience, cognitive flexibility, attention, and executive functions.
- These practices can play a role in the formation of identity, self-esteem, and social integration, creating conditions for experiencing competence, social recognition, and community belonging, especially in childhood and adolescence and can contribute to strengthening social support and developing communication and teamwork skills.

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Graphical abstract

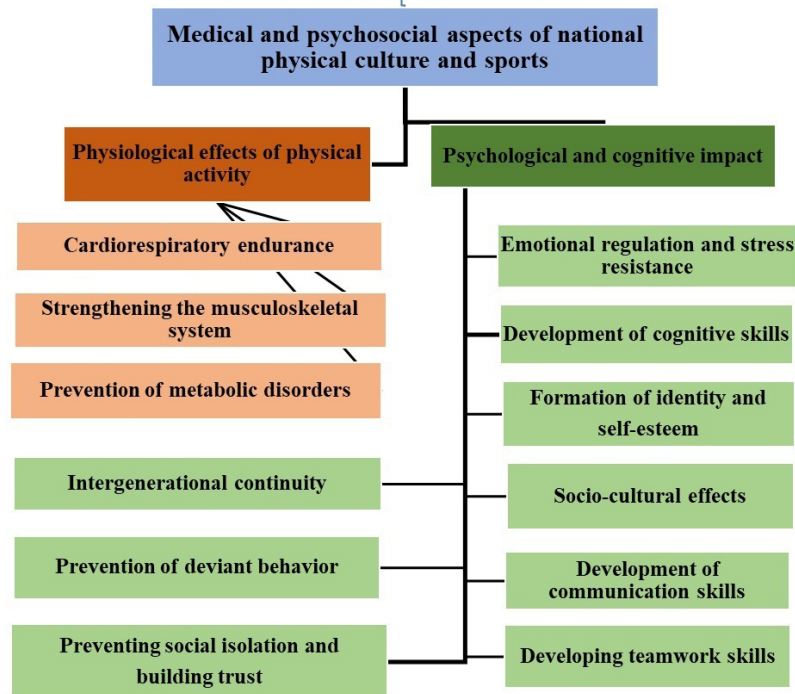


Heart, Vessels and Transplantation

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The purpose of this analytical review article is to summarize modern data obtained from scientific databases (eLIBRARY, Google Scholar, Scopus, Web of Science, etc.) on the possibilities of Kyrgyz national physical culture and sports from a medical and social perspective



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Introduction

Kyrgyzstan is a predominantly mountainous country: over 90% of its territory is located in mid- and high-altitude areas. These natural and geographical features have largely determined the specific development of Kyrgyz national physical culture and sport. Traditional movement practices, developed in the context of high-altitude nomadic life, are distinguished by their high functional focus, adaptive potential, and pronounced health benefits.

This fact has been widely studied in various fields of scientific knowledge. The impact of mountain climate on the human body has been most thoroughly explored in climatology, medicine, physiology, biology, and sports science. Scientific studies have detailed the body's adaptive responses to hypoxia, the specifics of metabolic and cardiorespiratory

changes, and the impact of the mountain environment on physical performance and endurance.

However, despite the favorable natural conditions for physical activity developed in the high-altitude environment and traditional nomadic lifestyle, in the modern era, the natural mechanisms for developing physical activity in children and adolescents are gradually being lost. The gap between the historically established way of life and modern socio-cultural conditions leads to a decline in daily physical activity.

As a result, the deteriorating health of the younger generation is becoming one of the key medical and social challenges for the healthcare systems of post-Soviet countries, including Kyrgyzstan.

According to educational and medical monitoring data, the number of schoolchildren with physical inactivity, poor posture

and scoliotic deformities, poor vision, excess weight, anxiety and depressive symptoms, and reduced stress tolerance is increasing annually.

One significant factor is the distance children receive from the natural forms of physical activity characteristic of the traditional Kyrgyz environment, where physical activity was organically integrated into everyday life. Regular physical activity and sports throughout life have been shown to be associated with a longer, healthier lifespan and delay the development of more than 40 chronic diseases (1).

Historically, Kyrgyz nomadic culture developed a complex of physical activity, including the development of endurance (long journeys), functional strength (working with animals and farming), coordination and balance (horseback riding), playing skills (ordo, ak chölmök), and martial arts (kырөsh) (Fig. 1). From an early age, Kyrgyz boys were trained in horseback riding, swordsmanship, archery (Fig. 2), and foot and horse wrestling (2). These forms of physical activity served as a natural means of preventing many diseases and functional disorders characteristic of the modern lifestyle.



Figure 1. Kuresh.

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Figure 2. Archery.

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In today's world, the use of national forms of physical education is considered a strategically important area of preventive medicine and public health. National sports and game practices are highly adaptable, emotionally appealing, and culturally acceptable, making them an effective tool for improving the health of children and adolescents (3, 4).

Kyrgyz national physical culture and sport are an integral part of the material, spiritual, and moral heritage of the people. Since the Republic's independence, interest in national physical culture has grown as a social phenomenon and a factor in sustainable personal development.

National physical culture is a unique phenomenon of the shared culture of an ethnic group, serving as a link between the past and present stages of societal development, and between the social and biological aspects of human development. It is one of the first and most fundamental forms of culture, formed through everyday life. National sports and games have

significant potential to influence physical health, spiritual and moral values, and the psycho-emotional state of the individual.

While the influence of national sports and games on maintaining and strengthening health, physical development, and morphofunctional indicators is beyond doubt, their role in shaping spiritual values requires additional scientific substantiation.

The values of national physical culture and sport should be considered at two levels: societal and individual. The mechanism by which societal values are transformed into personal assets is crucial. Values, as socially conditioned components of culture, shape stable notions of what is significant and desirable and become part of the individual's spiritual world.

Each historical era and each people possess their own value system, reflecting the specific characteristics of their culture and way of life.

In this context, national physical culture and sport act not only as a means of physical development, but also as an important medical and social resource for strengthening health, preventing diseases, and promoting the harmonious development of the individual in the context of modern sociocultural transformations.

The purpose of this analytical review article is to summarize modern data obtained from scientific databases on the possibilities of Kyrgyz national physical culture and sports from a medical and social perspective.

Methods

This article examines the value potential of Kyrgyz national physical culture and sports from the perspective of the medical and social health of the population. A literature search was conducted in eLIBRARY, Google Scholar, Scopus, Web of Science, and national scientific sources for the period 2000–

2024, using the keywords: "Kyrgyz national physical culture," "national sports," "traditional sports," "physical culture values," "population health," "medical and social aspects," and "impact on health."

Over 400 publications were initially identified, of which 254 were selected for analysis after removing duplicates and irrelevant sources. In the next step, 150 publications were examined in their full texts and excluded for the following reasons: lack of analysis of the value or medical-social component (n = 71), descriptive nature without scientific justification (n = 37), publications in non-peer-reviewed sources (n = 37) and methodological shortcomings (n = 5). In the final stage, 104 sources were included in the review, including peer-reviewed articles, books, monographs, and official international documents.

The literature selection process is presented in the flowchart (Fig. 3).

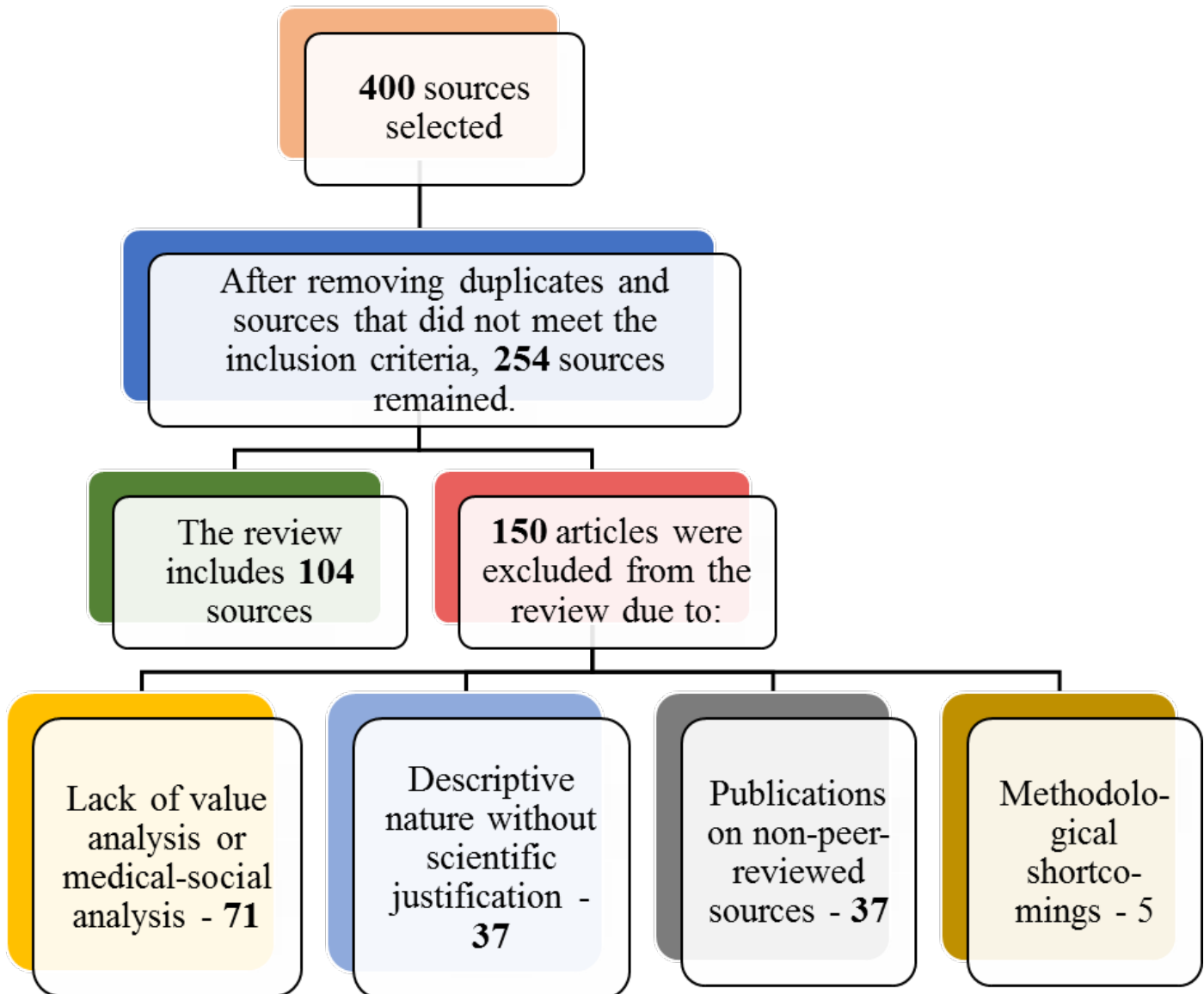


Figure 3. Flowchart of studies' search and selection

The study's methodological framework included analytical, comparative-historical, systemic, and content analysis. Particular attention was paid to the impact of traditional forms of physical activity and national sports on physical, mental, and social health, the development of value orientations, the strengthening of social cohesion, and the preservation of cultural heritage. An analysis of the sources confirmed that Kyrgyz national physical culture has preventive potential for chronic diseases, promotes a healthy lifestyle, and plays a significant role in medical and social rehabilitation and the education of the younger generation.

Physiological Effects of Physical Activity

Cardio-respiratory endurance

Cardiorespiratory endurance is a key indicator of physical health and physical activity, especially in childhood and adolescence. Physical performance is largely determined by the functional state of the cardiorespiratory system. A close relationship has been established between indicators of its functional state and the level of physical performance in athletes of various age groups participating in various sports.

A child's body is characterized by intensive growth and development processes, with organs and systems actively developing, making it highly sensitive to physical activity. Regular physical activity in childhood helps increase the body's functional and adaptive reserves, improve health, and enhance physical and mental performance (5, 6).

Cardiorespiratory fitness is considered a clinical indicator reflecting the body's ability to transport and utilize oxygen during aerobic muscular activity. Low levels of cardiorespiratory fitness are a significant risk factor for cardiovascular disease and are associated with increased cardiovascular mortality (7-10).

At the same time, numerous studies emphasize that high levels of cardiorespiratory fitness are developed primarily through regular aerobic exercise of moderate and variable intensity, characterized by duration, cyclicity, and the involvement of large muscle groups.

From this perspective, traditional forms of active exercise, historically ingrained in the people's culture and possessing significant health benefits, are of particular interest. In particular, traditional Kyrgyz group games such as "ordo", "arkan tartysh", "alaman baige", "kyz kuumai", and others can be considered a natural form of aerobic exercise, seamlessly combining physical activity, competition, and social interaction.

Traditional Kyrgyz team sports are divided into those involving aerobic and mixed (aerobic-anaerobic) physical activity, including running and relay races, jumps, frequent changes in direction, team competitions, and dynamic game exercises. This complex nature of movement strengthens the cardiovascular system, improves respiratory function, increases maximum oxygen consumption (VO_2 max), and develops overall endurance and motor coordination (11-13).

Regular participation in team sports promotes the development of sustainable physical activity habits, reducing the risk of physical inactivity, obesity, and associated metabolic disorders. Motivation plays a significant role: social support, teamwork, and a competitive nature increase participant engagement and promote high levels of physical activity throughout the game session, making the exercise aerobically effective and sustainable over time (14-16).

Strengthening the musculoskeletal system

Strength, physical fitness, balance, and agility have been key functional abilities necessary for survival throughout human history. For our ancestors, these qualities developed naturally through everyday physical activity related to hunting, traveling over rough terrain, working, and defending themselves. Therefore, strength and coordination abilities initially developed as an adaptive response to life's challenges. The primary function of strength training is to develop and maintain muscle mass, and regular physical activity promotes muscle health, strength, balance, and overall functional efficiency (17, 18).

With age, there is a natural decline in muscle mass and strength, which accelerates after age 60. Degenerative loss of skeletal muscle mass (sarcopenia) and strength (dynapenia) is closely associated with aging and is accompanied by an increased risk of falls, functional impairment, and decreased mobility (19). These changes are due to both neural factors (loss of alpha motor neurons) and morphological changes in muscle tissue, including a decrease in the number and volume of type II fibers (20). However, these age-associated processes are not irreversible, since numerous studies confirm the high effectiveness of strength training in increasing muscle strength and mass, as well as in slowing down or partially reversing age-related changes (21). Borde et al. (22) showed a significant improvement in muscle strength in healthy elderly people with regular strength training, and a positive effect was observed for both the upper and lower extremities. It has been established that performing strength exercises 2-3 times a week, either alone or in combination with other forms of activity, effectively contributes to the development of muscle strength (23).

The American College of Sports Medicine emphasizes the importance of incorporating bone-strengthening exercises into physical activity, such as axial-loading exercises (tennis, stair climbing, jogging), jumping exercises (volleyball, basketball), and strength training, including weight lifting (24). These recommendations directly align with traditional forms of physical activity found in traditional sports and folk games.

Effective interventions for stimulating bone growth and maintaining bone mass rely on mechanical loading on bone, which occurs during aerobic, weight-bearing, and strength exercises (25). Balance exercises should include progressively more complex poses, a reduced support surface, dynamic shifts in the center of gravity, stress on postural muscles, and reduced sensory input. Such elements are fully present in traditional Kyrgyz team games, where participants constantly

change direction, perform jumps, sudden stops, throws, and balance exercises.

Furthermore, gradually increasing forces applied to bone during physical activity stimulate adaptation processes through bone cell deformation (24). Systematic reviews confirm the effectiveness of strength and resistance training in slowing age-related decline in bone mineral density (11, 26, 27).

In this context, Kyrgyz national team games, which play a significant role in the development and strengthening of the musculoskeletal system in children and adolescents, deserve special attention. Dynamic game actions—running, jumping, squats, throwing, maintaining balance, and frequent changes in direction—provide a comprehensive effect on muscles, joints, and bones, promoting the development of muscle strength, coordination, flexibility, and general motor fitness. Regular participation in such games during periods of active growth promotes correct posture, strengthens ligaments, and develops joint mobility.

Research shows that engaging children in active play practices increases bone density and reduces the risk of musculoskeletal disorders, including scoliosis, flat feet, and weak core muscles (14, 15).

The team-based nature of Kyrgyz folk games helps children develop skills in distributing effort, controlling their own body, and coordinating movements with partners. This not only improves physical performance but also reduces the risk of injury due to the natural, varied, and gradually increasing load (16, 28).

Prevention of metabolic disorders

Metabolic syndrome is one of the most significant medical and social problems in modern society, affecting approximately a quarter of the world's adult population (29, 30). Metabolic disorders significantly increase the risk of developing type 2 diabetes, cardiovascular disease, and premature mortality (30-32).

Type 2 diabetes is closely associated with insulin resistance and often develops in parallel with obesity, hypertension, and lipid metabolism disorders, increasing the risk of stroke and myocardial infarction (33, 34).

Modern research emphasizes the leading role of physical activity in the prevention and correction of metabolic disorders. Aerobic exercise improves cardiorespiratory endurance, glycemic control, and lipid profile, while strength training promotes increased muscle mass, decreased fat deposits, and increased tissue sensitivity to insulin (35). Although strength training has traditionally been considered an adjunct to aerobic exercise, accumulated evidence indicates comparable and, in some cases, superior effectiveness in reducing cardiovascular risk factors (33).

Of particular significance is the fact that fat mass is more closely associated with cardiovascular mortality than body mass index (36). In this context, strength training acquires important

preventative value, as it promotes fat loss and stimulates the release of myokines, which play a key role in regulating lipid metabolism and activating anti-inflammatory mechanisms (37, 38). Conversely, excess adipose tissue functions as an endocrine-active organ, serving as a source of chronic systemic inflammation underlying the development of metabolic and cardiovascular diseases (39).

From this perspective, Kyrgyz national sports and traditional team games are of particular interest, as their structure naturally combines aerobic and anaerobic components of physical activity. Such activities, including running, abrupt changes in direction, jumping, throwing, wrestling, and strength resistance, are particularly effective in correcting metabolic syndrome.

Regular participation in sports helps maintain normal blood glucose levels, improve insulin sensitivity, and normalize lipid profiles, which is supported by data on the positive impact of physical activity on metabolic health (15, 40). The combination of aerobic and strength training in dynamic team games reduces the risk of obesity, a key factor in the development of metabolic syndrome in childhood and adolescence (41, 42).

Psychological and Cognitive Impact

Emotional regulation and stress resilience

Emotional regulation and stress resilience are important components of social adaptation and individual well-being. Modern psychological and sociological research emphasizes that the ability to manage emotional reactions, adequately cope with stressful situations, and recover from emotional tension is developed primarily through social interaction and practical activities (43-45). Particularly important are forms of activity that combine physical, cognitive, and emotional components.

Exercises combining physical movement, cognitive focus, and deep breathing have been shown to effectively reduce stress levels and improve psychological well-being (46). Sustained attention to present-moment experiences strengthens functional connections between the default mode network and executive control areas, leading to improved attention, emotional regulation, and metacognitive awareness (47, 48).

National games traditionally include elements of concentration, ritualized interaction, and collective attention, creating conditions for developing self-regulation skills. Through participation in such games, players learn to control emotional reactions, focus on the actions being performed, and respond appropriately to the behavior of other participants. Regular participation in national games helps strengthen resilience, as participants practice maintaining emotional balance and adapting to the social and physical challenges of the gaming environment.

Play involves alternating successes and failures, competitive elements, adherence to rules, and decision-making under uncertainty. In these conditions, participants develop impulse control, learn to cope with frustration, regulate aggression,

and adapt flexibly to changing game situations. Modern research in the field of physical activity and play practices shows that group and traditional games reduce emotional stress and anxiety, promoting the development of effective coping strategies and increasing stress resilience (11, 15). The emotionally charged yet socially controlled nature of play allows for the safe experience of intense emotions and the development of socially acceptable ways of expressing them.

The collective nature of Kyrgyz games is particularly significant, with emotional support from the group and a sense of community serving as important factors for psychological protection. Research confirms that social support during shared activities significantly reduces the negative impact of stress and promotes the development of psychological resilience (49, 50).

Physical and mental training have a significant impact on neuroplasticity, promoting a state of psychophysiological calm and reducing levels of stress hormones, particularly cortisol (51). It has been emphasized that chronically elevated cortisol levels have an adverse effect on brain health and cognitive functioning (52). For example, yoga combines physical activity, breathing techniques, and mindfulness, which is associated with improved cognitive function, the development of emotional regulation, and structural changes in the brain (52-54).

Similar mechanisms can be identified in traditional Kyrgyz sports, which include not only physical activity but also elements of concentration, self-control, breathing regulation, and emotional restraint. Activities such as wrestling, equestrian sports, and team competitions require sustained attention, quick decision-making, and emotional management under physical and social stress. Regular participation in Kyrgyz sports practices can help reduce stress, strengthen neural pathways associated with cognitive control and emotional regulation, and develop psychological resilience.

Cognitive development

Physical activity is a powerful non-drug treatment and preventative measure that helps improve cognitive function. Regular exercise stimulates neuroplasticity, improves cerebral blood flow, and promotes the production of neurotrophic factors, which collectively positively impacts mental performance and learning.

Kyrgyz team games have a significant impact on the development of attention, memory, logical thinking, as well as planning and decision-making skills. Game activities present participants with tasks of varying complexity, requiring situational analysis, predicting the actions of other players, choosing the optimal strategy, and promptly adjusting behavior in real time (55- 57). Problem-solving and critical thinking skills are developed through collaborative game activities. Team games require coordination, role-playing, and adaptation to constantly changing conditions, which contributes to the development of strategic thinking and the ability to make collective decisions (28). Modern research

confirms that game and physical activity improve cognitive flexibility, information processing speed, and attention span, which is especially important for children and adolescents (28, 58-60).

Furthermore, aerobic exercise increases heart rate and improves cerebral blood flow, promoting more efficient delivery of oxygen and nutrients to neural tissue.

This is accompanied by an increase in brain-derived neurotrophic factor levels, which leads to improved memory, learning ability and overall cognitive performance (61, 62).

Strength training, in turn, contributes to increased muscle strength and endurance, and stimulates the production of myokines—biologically active proteins secreted by skeletal muscles. These substances have a neuroprotective effect, enhance synaptic plasticity, and promote the growth of new neurons (63). As a result, improved executive functions, working memory, and concentration are observed, as well as reduced levels of neuroinflammation and oxidative stress, which positively impacts cognitive health. Physical activity promotes the production of internal antioxidants, such as superoxide dismutase and glutathione, which help counteract harmful free radicals. The presence of this protective effect is important for maintaining the health and functioning of neurons, promoting increased neuroplasticity and cognitive resilience (64). Traditional Kyrgyz games, by integrating cultural and social components, contribute to the development of metacognitive skills, including the ability to analyze one's own actions, predict their consequences, and take into account the interests of other participants.

Group games have significant educational and psychosocial impact. They develop motor planning, spatial thinking, self-control, and communication skills, and also create conditions for the development of teamwork and mutual assistance (45).

Formation of Identity and Self-Esteem

The formation of human identity occurs through the understanding of social roles performed and is considered a dynamic system developing through the interaction of individual characteristics and the social environment (65, 66).

Kyrgyz national sports (kök börü, alysh, ordo, toguz korgool) extend beyond physical activity and acquire a pronounced cultural and symbolic significance, being linked to historical memory, ethnicity, and traditional values of Kyrgyz society. Participation in national sports fosters a strong sense of group identification and social recognition, which is an important condition for the development of self-awareness and the individual's integration into the sociocultural space.

The self-esteem of athletes involved in national sports is largely determined by the level of perceived competence, the success of fulfilling a social role, and the degree of social approval from significant others and the community as a whole (67, 68). Collective Kyrgyz traditional games also play an important role in the formation of personal identity and self-esteem, as they provide social recognition, a sense of belonging to a cultural

tradition, and a positive experience of one's own significance within the group.

In the traditional sports environment of Kyrgyz society, these needs are often realized through the continuity of generations, a mentoring system, and public recognition of sporting achievements.

Developing a sporting identity in national sports can contribute to increased self-confidence, personal resilience, and successful socialization, as well as facilitate transitions between stages of a sporting career (69-71). However, excessive focus on the athlete's role and identity closure can limit the exploration of alternative social and professional roles, potentially leading to decreased self-esteem, emotional burnout, and difficulties during the retirement period (72-74).

Through collaborative gaming activities, participants receive social feedback, a safe space for experimenting with roles and behavior patterns, and an awareness of their role in the group and their own capabilities, which contributes to the development of a positive self-image and an understanding of one's social position (28, 68, 75).

Modern research also emphasizes that participation in team and traditional games strengthens not only an individual sense of self-worth but also a collective sense of community, shaping an ethnocultural identity (76).

Psycho-social-cultural effects

Social integration is considered a key mechanism for the sustainable functioning of traditional societies, ensuring the inclusion of individuals in a system of social connections, norms, and values (28). In traditional Kyrgyz culture, collective folk games play a significant role in this process, historically serving not only entertainment but also a significant social and educational function (77). Through participation in shared gaming activities, individuals learn social roles, norms of interaction, and collective values, which contributes to their inclusion in the community and the formation of a stable social identity.

Most Kyrgyz games are collective in nature and are based on principles of shared participation, mutual responsibility, and coordination. Modern research on play confirms that collective play is a stable form of social interaction, where behavior patterns, communication skills, and cultural meanings are formed (28, 78).

Active socialization in a community correlates with a longer and healthier life. People with the most integrated social lives have the best prognosis for heart attacks, strokes, HIV/AIDS, and cancer, among other diseases.

Social integration has a powerful impact on health by strengthening meaningful social roles and attachments, as well as by facilitating access to resources and material goods through social networks (79, 80).

Childhood conditions and circumstances have been shown to influence health in older age (81, 82). This underscores

the particular importance of early forms of social integration, including play and sports practices in childhood and adolescence, as factors that contribute to the development of sustainable behavioral and psychosocial resources throughout life. Therefore, it is necessary to encourage young people to join sports clubs, where they have the opportunity to establish interpersonal connections, develop leadership skills, and realize their personal potential (83).

Team and individual sports are traditionally viewed as effective means of teaching cooperation, communication, trust, and respect for teammates (84, 85). Participation in competitions and training with peers allows adolescents to make friends, expand social connections, and develop a sense of community. Through such experiences, adolescents not only increase self-confidence and emotional resilience but may also be motivated to volunteer, raise awareness of social issues, and contribute to the public good (86).

Developing collaboration skills

Collective Kyrgyz games create a unique communicative space, involving constant verbal and nonverbal interaction between participants. During the game, information is continuously exchanged, actions are coordinated, and participants respond quickly to each other's behavior, which contributes to the development of active listening skills, clear expression of thoughts, and consideration of other participants' positions (28). Due to the repetitive nature of game situations and the need for joint decision-making, communication acquires a meaningful and functional character, aimed at achieving a collective outcome.

Modern psychological and pedagogical research confirms that game-based activities are an effective model of social communication, through which social roles, norms of interaction, and forms of collective responsibility are learned.

Adolescent participation in training and competitions promotes the development of communication skills through regular interaction with peers and involvement in joint activities (84, 85). In team sports, in particular, adolescents learn to effectively exchange information, express their own position, consider the opinions of their teammates, and constructively resolve interpersonal conflicts, which strengthen intra-team communication and promote social integration (87- 89).

Data indicate that the level of acceptance of teammates and the quality of communication in conflict situations are key predictors of social cohesion and the effectiveness of team interactions (87). This indicates that communication processes in sports and traditional team games have similar structural characteristics and perform comparable social developmental functions.

Developing teamwork skills

Group games promote the development of teamwork skills by requiring constant coordination, role assignment, and shared decision-making. Joint activities in a game-like format enhance a sense of group belonging and promote the

development of sustainable collaboration skills (28). In a group game, individual actions acquire meaning only in conjunction with the actions of other participants, which fosters a focus on a shared outcome.

Group activities with shared goals and assigned roles promote the development of coordination skills, mutual support, and collective decision-making (84-90).

In Kyrgyz traditional games, team competition or joint goal achievement fosters an awareness of the interdependence of individual and collective success, which enhances the social integration potential of game activities. Participation in such games fosters an understanding of responsibility to the group, as well as a willingness to subordinate personal interests to collective goals, which is an important component of social adaptation. Scientific research shows that adolescent participation in team sports is positively associated with the development of a sense of belonging and more effective interactions with peers, which confirms their significant role in the process of social integration (85, 91).

Preventing social isolation and building trust

Collective games in traditional Kyrgyz society have historically served as a natural mechanism for integrating individuals into the social environment, reducing the risk of social isolation and alienation. Through regular participation in shared gaming activities, individuals were drawn into stable social connections, learned norms of interaction, and developed a sense of community. Modern research confirms that systematic participation in shared gaming practices strengthens interpersonal bonds, increases emotional engagement, and develops sustainable forms of social interaction.

The development of trust during gaming is closely linked to adherence to established rules, mutual support, and collective responsibility for outcomes. Such forms of shared activity contribute to the accumulation of social capital, strengthening trust networks, and developing mutual commitments within the group (28). In this context, Kyrgyz folk games serve not only as a form of leisure but also as a sustainable mechanism for social integration, ensuring the reproduction of cultural norms and collective identity.

Similar processes are observed in modern sports. Regular participation in sports training and competitions allows adolescents to expand their social network, form friendships, and develop a sense of community, thereby reducing the risk of social isolation (85, 92, 93).

Sports teams create favorable conditions for the development of trust, mutual respect, and emotional support, which is especially important during adolescence (84, 87). Adolescent participation in sports activities, especially team sports, significantly enhances a sense of belonging and the quality of interactions with peers, even if these effects do not always translate into broader social or civic engagement (88).

Prevention of deviant behavior

Prevention of deviant behavior is an important aspect of social integration, especially among children and youth.

Contemporary sociological and psychological-pedagogical research views deviant behavior as a result of a lack of social inclusion, weakening of social ties, and a lack of constructive forms of collective activity (43).

Collective Kyrgyz games are an effective tool for preventing deviant behavior, as they create a normatively organized space for social interaction based on rule-based compliance, role distribution, and collective responsibility. Participation in structured group activities promotes self-control, reduces aggression, and fosters socially acceptable behavior patterns.

Involvement in traditional gaming practices fosters a positive social identity and a sense of belonging, which is an important factor in reducing the risk of antisocial and deviance (28).

Of particular importance is the educational potential of Kyrgyz folk games, which convey cultural norms of mutual respect, fairness, and collective responsibility. Through gaming, social norms and mechanisms of informal social control are internalized, which is particularly important in the primary socialization of children and adolescents (43).

Modern sport also serves as a significant protective factor, offering adolescents a constructive alternative to antisocial behavior, including delinquency and alcohol or drug abuse (91, 94, 95).

Participation in sports clubs and extracurricular physical activity programs promotes self-discipline, responsibility, and a focus on socially approved norms of behavior (90, 95). Furthermore, involvement in sports activities reduces the likelihood of social marginalization, which is often considered a predictor of deviant behavior (96).

Intergenerational continuity

Intergenerational continuity is considered in modern humanities research as one of the key mechanisms for preserving cultural identity and the sustainability of traditional communities. The transmission of cultural norms, values, and behavioral patterns between generations occurs primarily through repetitive social practices with symbolic and educational potential, including traditional folk games (97, 98).

Collective Kyrgyz games serve as a significant tool for the intergenerational transmission of cultural experience, as they involve representatives of different age groups. Through shared play, the older generation transmits to the younger generation not only game skills and rules but also socially approved behavioral patterns—respect for elders, collective responsibility, honesty, mutual assistance, and adherence to traditions (77). Thus, play functions as a form of "living tradition," ensuring the preservation of cultural memory.

Contemporary research in the field of intangible cultural heritage emphasizes that traditional games serve as informal education, contributing to the development of a stable ethnocultural identity in children and adolescents (99). Through game practice, cultural meanings and norms are internalized, strengthening the bond between generations and preventing the breakdown of tradition.

In the context of globalization and the transformation of forms of intergenerational interaction, collective game practices are acquiring particular significance as a means of preserving cultural continuity and social cohesion. Such forms of joint activity contribute to the strengthening of intergenerational solidarity and the resilience of local communities (28, 98). As a result, collective Kyrgyz games serve not only as an element of leisure but also as a mechanism for the reproduction of cultural meanings and values.

Sports clubs and teams integrated into the structure of local communities also facilitate the transmission of values, norms, and behavior patterns from older to younger generations (100, 101). Adolescents' participation in sport and community initiatives, such as charity events and volunteer projects, creates opportunities for interaction with mentors, coaches, and community representatives, strengthening intergenerational bonds (102). This continuity promotes social responsibility, civic awareness, and a strong sense of community belonging, even if the direct impact of sport on social engagement requires additional institutional and educational support (94, 103, 104).

Study limitations

The review has an analytical-descriptive character and is based on diverse sources, that limit qualitative evaluation and equating of results. Empirical data on medical and social effects of Kyrgyz national sports in children remains insufficient, and results cannot be extrapolated on other sociocultural conditions and cultural significance of the topic increases risk of biased interpretation and underestimation of possible risks.

Gaps in knowledge and directions for future research

Currently the long-term effects of national sports on cardiometabolic health of children and their effect on prevention of overweight remain less investigated. Data on influence of these forms of physical activity on cognitive and psychological development including formation of decision-making skills, self-regulation, self-evaluation and resistance to stress are limited. The social effects as development of communicative skills, social integration and prevention of deviant behavior are insufficiently studied. Moreover, the systematic comparative studies on efficacy of national and modern physical activity in children and teenagers are lacking. Above-mentioned issues should be addressed in future studies.

Conclusion

The analysis shows that Kyrgyz national physical culture and traditional sports represent a multidimensional medical and psychosocial resource for health, with significant health-promoting, psychoregulatory, and sociocultural potential. Developed in high-altitude environments and a nomadic lifestyle, these forms of physical activity combine aerobic and strength training, coordination elements, and social interaction, which may determine their functional and adaptive value.

The results indicate that traditional sports can contribute

to strengthening cardiorespiratory endurance, developing the musculoskeletal system, and preventing metabolic disorders. Along with physiological effects, their potential psychological and cognitive impact is noted: participation in collective gaming and sports practices may be associated with the development of emotional regulation, stress resilience, cognitive flexibility, attention, and executive functions. In this context, national games can be viewed as forms of social interaction that integrate physical, cognitive, and emotional processes in a culturally significant environment.

It appears that these practices could play a role in the formation of identity, self-esteem, and social integration, creating conditions for experiencing competence, social recognition, and community belonging, especially in childhood and adolescence. The collective nature of Kyrgyz games could contribute to strengthening social support and developing communication and teamwork skills.

Thus, Kyrgyz national physical culture and traditional sports could be viewed not only as elements of cultural heritage but also as a potential resource for preventive medicine and public health. The inclusion of traditional games and national sports in educational and health programs could be recommended as a promising approach to improving the physical and mental health of children and youth, which requires further empirical evaluation and scientific substantiation of the effectiveness of their systemic integration.

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