

SIBLING POSITION AS A CONDITION FOR THE FORMATION OF SOME FORMAL AND DYNAMIC FEATURES OF ATHLETES

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An athlete's performance is a major issue of the elite sports. The current studies are focused on various factors of success, however, the effect of sibling position on the athlete's personality formation is poorly understood. The study was aimed to assess the correlation of the formal and dynamic features with the resource potential in athletes who played badminton based on their sibling position using the structured interviews; Questionnaire of Formal and Dynamic Properties of Personality by V.M. Rusalov; Perinatal Experience – Resource Potential test by N.P. Kovalenko; correlation analysis. A total of 40 athletes were enrolled (20 boys and 20 girls; average age 14.5 year). In the “eldest or only child” subsample, the athletes' communicative plasticity negatively correlated with the parameters of sensory and physiological systems ($r = -0.50$), as well as stress tolerance ($r = -0.60$). Correlations between the stress tolerance and psychomotor ergicity ($r = 0.63$), etc., were revealed. The athletes of the “second or later-born child” subsample had higher psychomotor plasticity and a larger resource potential ($p < 0.05$). The basic perinatal matrix is integrated into the formal and dynamic structure of the athlete's personality. Thus, athletes of the “second or later-born child” subsample have a higher resource potential. Athletes of the “eldest or only child” subsample show lower psychomotor plasticity, however, they are more tenacious in fulfilling their goals. The areas of concern for the sports psychologist who works with athletes are highlighted in accordance with the results.

Keywords: athletes, sibling position, basic perinatal matrices, resource potential, communicative emotionality, communicative plasticity

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СИБЛИНГОВАЯ ПОЗИЦИЯ КАК УСЛОВИЕ ФОРМИРОВАНИЯ НЕКОТОРЫХ ФОРМАЛЬНО-ДИНАМИЧЕСКИХ ОСОБЕННОСТЕЙ СПОРТСМЕНОВ

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В спорте высших достижений проблема результативности спортсмена — одна из ключевых. В современных исследованиях уделяют внимание различным факторам успешности, но остается неизученным влияние sibling position на формирование личности спортсмена. Целью работы было изучить взаимосвязь формально-динамических свойств и ресурсного потенциала спортсменов, занимающихся бадминтоном, в зависимости от их sibling position с использованием структурированного интервью; «Опросника формально-динамических свойств индивидуальности» В. М. Русалова; теста «Перинатальный опыт — ресурсный потенциал» Н. П. Коваленко; корреляционного анализа. В исследовании участвовало 40 спортсменов (20 юношей и 20 девушек; средний возраст — 14,5 лет). В подвыборке спортсменов «старший или единственный ребенок» коммуникативная пластичность отрицательно коррелирует с показателями сенсорных и физиологических систем ($r = -0,50$) и стрессоустойчивостью ($r = -0,60$). Выявлены корреляции между стрессоустойчивостью и психомоторной эргичностью ($r = 0,63$) и др. Спортсмены подвыборки «второй и последующие дети» обладают большей психомоторной пластичностью и большим ресурсным потенциалом ($p < 0,05$). Базовая перинатальная матрица интегрирована в формально-динамическую структуру личности спортсмена. Таким образом, спортсмены подвыборки «второй и последующие дети» обладают более высоким ресурсным потенциалом. Спортсмены подвыборки «старший или единственный ребенок» менее психомоторно пластичны, но более упорны в достижении целей. В соответствии с результатами обозначены направления работы спортивного психолога со спортсменами.

Ключевые слова: спортсмены, sibling position, базовые перинатальные матрицы, ресурсный потенциал, эмоциональность коммуникативная, пластичность коммуникативная

Вклад авторов: Т. В. Богун — сбор материала, дизайн и концепция исследования, написание статьи, обзор литературы и интерпретация данных; О. В. Ракитина — анализ литературы, планирование эмпирического этапа исследования, анализ и интерпретация результатов, редактирование; С. В. Горнов — редактирование, утверждение окончательного варианта статьи, общее руководство.

Соблюдение этических стандартов: исследование проведено в соответствии с методическими рекомендациями «Организация и проведение психофизиологических обследований спортсменов сборных команд России в рамках углубленных медицинских осмотров», утверждено Ученым советом ФГБУ «Федеральный научно-клинический центр спортивной медицины и реабилитации ФМБА России» (протокол № 4 от 3 июня 2016 г.), а также в соответствии с методическими рекомендациями «Оценка психологического состояния высококвалифицированных спортсменов при проведении УМО», утверждено Ученым советом ФГБУ «Федеральный научно-клинический центр спортивной медицины и реабилитации Федерального медико-биологического агентства» (протокол № 16 от 29 марта 2018 г.); все участники подписали добровольное информированное согласие на участие в исследовании.

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Athletic performance is a major issue of sports psychology. The current studies are focused on such factors of success in elite sports, as the athlete's age, morphological features of his/her body [1, 2], features of birth [3], influence of the family, personality traits, societal attitudes [4], etc.

However, among various papers on elite sports, no reports taking into account the impact of sibling position on the athlete's personality formation in general and specifically on his/her athletic performance have been found. At the same time, there are papers not related to sports psychology that are focused on the rather thorough investigation of the family relationships taking into account the sibling positions of children and adults during the study of personality. Thus, in perinatal psychology, extensive theoretical and empirical experience of studying the impact of the features of birth on the individual's mental and physical development has been accumulated. The papers by the leading experts in perinatal psychology [5–10] provide the review of various areas and directions of perinatal psychology, which include not only such conventional areas, as perinatal medicine (fetal diagnosis and therapy) [8]; adaptability theory; concept of instincts and psychosomatic disorders [7]; Jungian analysis [9]; but also a rather new area, the concept of perinatal matrices [9].

Perinatal matrix is an information unit of the personal unconscious associated with birth experience [9]. Perinatal experience is manifested in three patterns of experiences, basic perinatal matrices (BPM), which correspond to four clinical stages of birth [5]. The birth is first and foremost overcoming the barriers. Successful birth outcome reinforces the motor patterns of birth as a certain scheme which leads to success, including, as we assume, success in sports.

Thus, birth experience represents the moment when intrinsic behavioral acts are formed, which are related to mobilization of the individual's internal resources directed towards overcoming the external and internal conflicts and realization of activity program, including that of sports activity [3].

According to the BPM concept, the resource potential of personality is an important construct. The resource potential is a combination of the subject's qualities or a special integral quality that performs the function of the subject's "realization", i.e. determines and ensures the effectiveness of implementing all kinds of activity in certain objective conditions [11].

The concept of sibling position (siblings or sibs are brothers and sisters born in the same family) includes formal characteristics of the individual's circumstances of birth: birth order, gender, and spacing between births. The first idea that the child's personality depends on his position among brothers and sisters belongs to A. Adler. He discussed this matter within the framework of the area of individual psychology he had developed and claimed that birth order was an important factor of personality development that determined the individual's personality characteristics in childhood and adulthood [12]. The hypothesis of the study is as follows. It is assumed that formal and dynamic features, as well as the resource potential of athletes playing badminton significantly correlate with their sibling positions: the athletes being the second or later-born children have more prominent formal and dynamic features and a higher resource potential compared to athletes being the eldest or only children.

The study was aimed to assess the correlation of formal and dynamic features and the resource potential of athletes who played badminton with their sibling positions. The objectives were as follows: 1) to identify the specifics of formal and dynamic features of athletes playing badminton taking into account their sibling positions; 2) to identify the features of the resource potential of athletes with different sibling positions;

3) to identify the points of corrective interventions aimed at improving the resource potential and athletic performance during the period of competitions for the sports psychologist.

METHODS

Subjects

The study was performed in the Training Center, Kratovo urban locality (Moscow Region), where the badminton training session for athletes (juniors) was carried out.

The study involved 40 athletes, among them 20 boys and 20 girls aged 13–15 (average age 14.5 years). The subjects were candidates for master of sports realizing themselves in elite sports. The athletes were divided into two groups based on the birth order: the first group included the "eldest and only children", and the second one included the "second and later-born children" (according to the order of birth in the family). Inclusion criteria: first and second grade athletes, candidates for master of sports. Exclusion criteria: masters of sports, twins.

Theoretical and methodological approach. Our study was based on the idiodynamic research paradigm by V.M. Rusalov allowing one to assess the formal and dynamic features of the athlete's personality resulting from consolidation of innate biological programs operating under the logic of the "body" or the individual's general biological constitution [13, 14]. Our study of the sibling positions was based on the review and assessment reports of the research on sibling relationships [12, 15, 16].

Methods

Structured interview

We conducted structured interviews with the athletes enrolled in the study, during which we consistently collected the data on the athlete's sibling position in the family.

Questionnaire of Formal and Dynamic Properties of Personality (QFDPP) by V.M. Rusalov [17]

This test is used for the diagnosis of the "objective-practical" (psychomotor and intellectual spheres) and "communicative" aspects. Such spheres of personality, as emotional, psychomotor, intellectual, and communicative spheres, are assessed.

The emotional sphere is represented by sensitivity, impulsivity, strength and dynamics of emotions. The psychomotor (motor) sphere is represented by general activity, i.e. the pace, rate, rhythm and overall number of movements. The intellectual sphere is represented by intellectual capabilities and the drive for activity related to mental strain. The communicative sphere is represented by the need for communication, desire to make acquaintances, sociability.

We also assessed the characteristics of personality that manifested in these spheres: ergicity (individual's endurance, both physical and mental), plasticity (the ability of mind to adapt to new conditions), rate (pace of responses, behavior, and mental processes), and emotionality (sensitivity, impulsivity, sensitivity to emotional influences and possible discrepancies with the initial ideas).

Perinatal Experience — Resource Potential test (N.P. Kovalenko)

This method is based on the system for identification of the memory units related to perinatal experiences. Perinatal

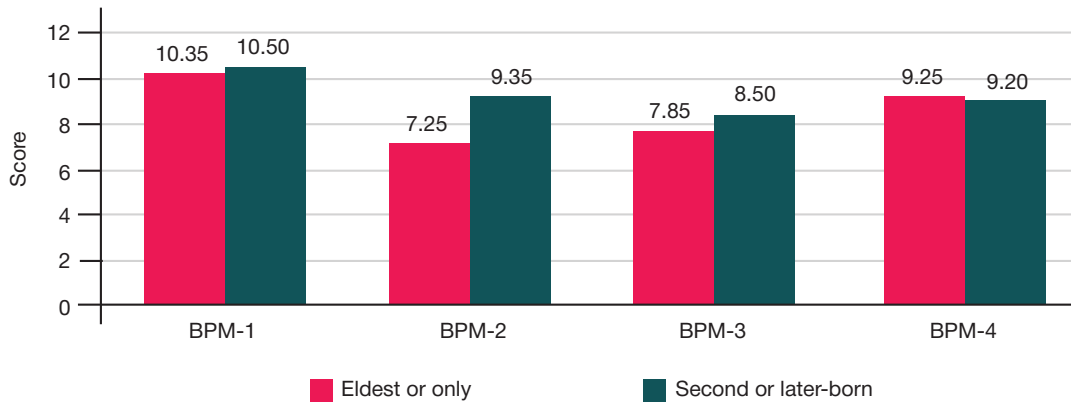


Fig. 1. Comparison of the features of the resource potential between athletes with different sibling positions (based on the Mann–Whitney *U* test) according to the Perinatal Experience – Resource Potential method

psychology has shown that perinatal experience has a significant influence on the formation of basic psychophysiological programs of the subconscious [9]. This means that such experiences affect behavioral patterns, strategies of self-realization and development. Perinatal trauma can be pushed deep down into the subconscious or compensated during life, but despite this such trauma can affect the individual's general mental health and resource potential [9]. The method allows one to assess these early experiences based on four matrices (BPM).

High values obtained for the first matrix (BPM 1) indicate maturation of sensory and physiological systems, accumulation of vital energy and good immunity, the ability to relax and enjoy life. Low values are indicative of problems in this sphere.

The values obtained for the second matrix (BPM 2) help to estimate the athlete's mobilization and stress tolerance, his/her ability to overcome difficulties and make quick decisions. Low values are indicative of bad experience, feeling helpless, desperate and guilty, when it is necessary to be active; the subject can be through "brainstorm" or feel scared.

The third matrix (BPM 3) allows one to estimate vital power, experience of struggle for survival or freedom, confidence in achieving the goal, activation of the leadership instinct. Low values are indicative of hesitant behavior, inability to fight, emergence of difficulties when trying to overcome the obstacles; the emergence of the attitude "someone else will do things for me" is possible.

The fourth matrix (BPM 4) allows one (in case of positive experience) to obtain information about the individual's quest for self-realization, his/her adaptive capacity, shaped basic trust in the world, activation of the leadership and survival instincts. When the earlier experiences are bad, the results for this matrix are indicative of vulnerability, distrust of the world, and feeling lonely.

Using the Mann–Whitney U test

Significance of differences between groups was determined using the Mann–Whitney *U* test.

Statistical analysis

The Spearman's rank correlation coefficient was used to assess significant correlations between the studied phenomena. Statistical processing of the results was performed using the STATISTICA ver. 10.0 software package (StatSoft; USA).

RESULTS

The study has made it possible to identify the specifics of the athletes' resource potential and formal and dynamic features taking into account the athletes' sibling positions.

One of the objectives of the study was to determine the specifics of formal and dynamic features of personality in athletes playing badminton based on their sibling positions ("eldest or only child" or "second or later-born child").

The analysis of values obtained for BPM 2 related to activation and dynamization of the processes related to ensuring sports activity together with the use of the Mann–Whitney *U* test has made it possible to reveal significant differences in the athletes' resource potential between groups (Fig. 1; Table 1).

Athletes of the "second or later-born child" group show significantly higher values (score 9.35) for BPM 2 compared to the athletes of the "eldest or only child" group (score 7.25). Athletes of the "second or later-born child" group have a 2.1% higher stress tolerance, ability of mobilization; it is easier for them to go through hardships, they can make decisions faster than athletes of the "eldest or only child" group.

The athletes' formal and dynamic features have been estimated using the QFDPP questionnaire (by V.M. Rusalov), the results are provided in Fig. 2.

The use of the Mann–Whitney *U* test (Table 1) has made it possible to reveal significant differences in psychomotor plasticity (flexibility of switching from one type of physical activity to another, propensity for various forms of motor activity) between groups.

Table 1. Significant differences in the indicators of formal and dynamic features of the athletes with different sibling positions (based on the Mann–Whitney *U* test)

Indicators of formal and dynamic features	Average values for BPM		Median (lower quartile; upper quartile)				Significance level
	Eldest or only child	Second or later-born child	Eldest or only child	Second or later-born child	<i>U</i>	<i>Z</i>	
BPM-2	7,25	9,35	7 (5,5; 9)	9 (8; 11)	114	2,35	0,018533
PP	33,85	36,1	34 (31; 36,5)	37,5 (31; 40)	129	1,91	0,048523

Note: * — differences at the significance level of *p* < 0.05; BPM 2 — the second basic perinatal matrix; PP — psychomotor plasticity.

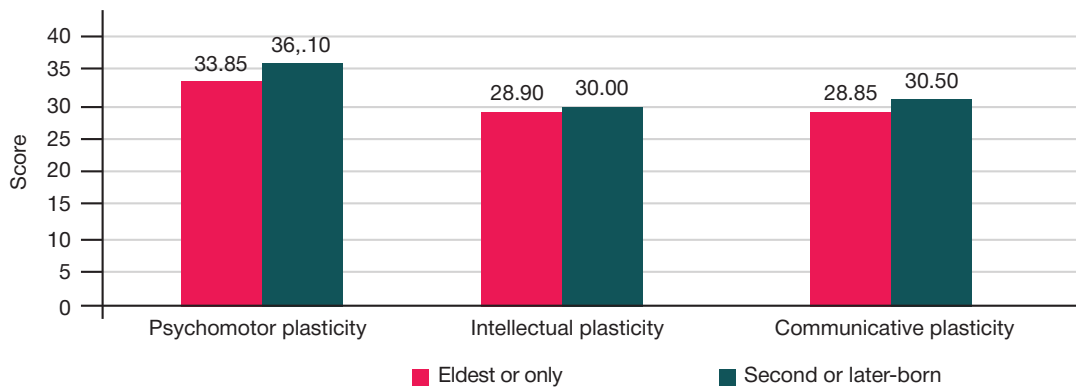


Fig. 2. Comparison of the formal and dynamic features of athletes with different sibling positions (based on the Mann–Whitney *U* test) according to the QFDPP questionnaire

Athletes of the “second or later-born child” group are characterized by the significantly higher psychomotor plasticity (score 36.1) compared to the athletes of the “eldest or only child” group (score 33.85) (Table 1). The athletes, who were the second or later-born children in their families, were 2.25% more active and dynamic, they showed easier and more successful overcoming of obstacles, and had the better shaped processes of activation and dynamization of livelihood. The athletes, who were the first or only children in their families, showed lower plasticity; they had to invest more energy to get results.

It has been found that the athletes, who are the second or later-born children in their families, are characterized by not only higher dynamism and activity (being their strengths in sports), but also by lower emotional stability. This makes them more vulnerable compared to the athletes, who are the first or only children in their families, and have higher emotional stability and tolerance due to lower plasticity. The patterns determined should be taken into account when working with athletes in order to improve their athletic performance during the competition cycle.

The correlations of the athletes’ formal and dynamic features and the resource potential with various sibling positions are provided in Table 2.

No significant correlation between the resource potential and formal and dynamic characteristics was revealed in the “eldest or only child” group. This suggests that these psychological substructures of personality are rather isolated from each other in athletes of this category (Table 2).

A number of significant negative correlations were revealed in the “second or later-born child” group of athletes: between the indicators of maturation of the sensory and physiological systems (BPM 1) and communicative plasticity ($r = -0.50$); between the indicators of stress tolerance, the ability to go through hardships, and communicative plasticity ($r = -0.60$).

In the same group (“eldest or only child”), positive correlations between the indicators of stress tolerance, the ability to go through hardships (BPM 2), psychomotor ergicity ($r = 0.63$), and psychomotor rate ($r = 0.61$) were revealed, i.e. athletes of this group were characterized by normal muscle tone and normal motor activity, moderate desire for physical stress and medium muscle performance, as well as by the medium rate of motor operations. The upper limit of the medium values of psychomotor ergicity and medium values of psychomotor rate were combined with medium scores for BPM 2, i.e. with such constructs, as activation and dynamization of the assurance processes, stress tolerance, the ability to go through hardships, the ability to make quick decisions. A less significant positive correlation ($r = 0.44$) between the athletes’ intellectual plasticity and their ability to go through hardships (stress tolerance) was also revealed.

Positive correlations between the indicators of vitality (BPM 3) and intellectual rate ($r = 0.53$), as well as between the indicators of vitality and intellectual plasticity ($r = 0.47$) were revealed in this group.

Significant correlations for each of four matrices were revealed in the “second or later-born child” group, which

Table 2. Matrices of intercorrelations among the athletes’ formal and dynamic features and their resource potential (based on the Spearman’s rank correlation coefficients; according to the QFDPP method)

Formal and dynamic characteristics of athletes	Sibling position: "elder or only child"				Sibling position: "second or later-born child"			
	BPM-1	BPM-2	BPM-3	BPM-4	BPM-1	BPM-2	BPM-3	BPM-4
PER	0.42	0.63	0.26	0.02	0.35	0.49	0.25	0.08
IER	-0.02	-0.02	-0.14	0.21	0.17	-0.05	0.58	0.05
IP	0.13	0.44	0.47	0.13	0.08	0.28	0.23	0
CP	-0.50	-0.60	-0.31	-0.05	-0.27	-0.29	-0.46	-0.32
PR	0.28	0.61	0.34	-0.12	0.28	0.21	0.31	0.06
IR	0.34	0.39	0.53	0.18	0.3	0.2	0.32	0.15
ME	-0.22	-0.28	0.05	0.23	-0.29	-0.34	-0.16	-0.49
IE	-0.28	-0.21	-0.17	0.07	-0.44	-0.47	-0.39	-0.20
CE	-0.33	-0.24	-0.02	0.04	-0.34	-0.49	-0.72	-0.25

Note: $n = 20$; BPM 1 — the first basic perinatal matrix; BPM 2 — the second basic perinatal matrix; BPM 3 — the third basic perinatal matrix; BPM 4 — the fourth basic perinatal matrix; PER — psychomotor ergicity; IER — intellectual ergicity; IP — intellectual plasticity; CP — communicative plasticity; PR — psychomotor rate; IR — intellectual rate; ME — motor emotionality; IE — intellectual emotionality; CE — communicative emotionality. Gray — correlations at the significance level of $p < 0.05$; light gray — correlations at the significance level of $p < 0.01$; dark gray — correlations at the significance level of $p < 0.001$.

suggested the high degree of the matrix parameter integration into the formal and dynamic structure of the athlete's personality (Table 2). Thus, a negative correlation between the indicators of maturation of the sensory and physiological systems (BPM 1) and intellectual emotionality ($r = -0.44$) was revealed.

The less significant negative correlations between the indicators of stress tolerance and intellectual emotionality ($r = -0.47$), as well as communicative emotionality ($r = -0.49$) were also found in this group. Athletes of this group are characterized by medium severity of emotional distress in case of failures in work and in the situations that require mental exertion; medium flexibility of switching from one type of physical activity to another; moderate propensity for various forms of motor activity.

In the "second or later-born child" group there was a positive correlation ($r = 0.49$) between the indicators of stress tolerance and psychomotor ergicity. The upper limit of the medium values of psychomotor ergicity (PER) was combined with the mostly high scores obtained for BPM 2, i.e. with such constructs, as activation and dynamization of the assurance processes, stress tolerance and the ability to go through hardships, as well as the ability to make quick decisions. Furthermore, there was a strong negative correlation ($r = -0.72$) between the indicators of vitality (BPM 3) and communicative emotionality (CE). The lower limit of the medium CE values was combined with the mostly high scores obtained for BPM 3, i.e. with such constructs, as confidence in achieving the goal, activation of the leadership instinct, and the desire for freedom. Athletes of this group showed a negative correlation ($r = -0.46$) between the indicators of vitality (BPM 3) and communicative plasticity. Moreover, in these athletes the indicators of vitality positively correlated ($r = 0.58$) with the indicators of intellectual ergicity.

DISCUSSION

Our findings are consistent with the results obtained by other researchers [9, 13, 14, 18], however, it should be emphasized that the authors of the above papers never conducted sibling studies in terms of elite sports. The results of our study make it possible to identify the points of psychocorrectional interventions when working with athletes of the selected categories.

Thus, when working with athletes, who are the first or only children in their families, it is reasonable to focus on improving stress tolerance, cultivate the ability to mobilize, teach the athletes to learn and use various coping mechanisms when experiencing hardships, and to learn the methods of quick decision making. Furthermore, the key directions are psychocorrectional exercises on switching attention from one

type of motor activity to another, as well as relaxation activities aimed at improving the recovery processes in athletes.

It is important to teach the athletes, who are the second or later-born children in their families, the methods for self-regulation of functional state and the methods for self-organization of educational, training and competitive activities, as well as to improve the athletes' volitional qualities, emotional stability and tolerance [19].

Furthermore, it is important for the sports psychologist working with the athletes enrolled (who are engaged in elite sports) to take into account a rather broad age range of the sports team when selecting and using the methods for working.

The development of the guidelines on working with athletes that take into account the athletes' sibling positions will allow the sports psychologist to organize psychological support of educational, training and competitive activities to make it even more differentiated and effective.

CONCLUSIONS

We have revealed significant differences in the resource potential of athletes playing badminton that result from their sibling positions: the athletes, who are the second or later-born children, have a significantly higher resource potential than the athletes, who are the first or only children in their families, having medium resource potential. The athletes of the "first or only child" group are characterized by significantly lower psychomotor plasticity compared to the athletes of the "second or later-born child" group; they overcome this conditional limitation due to tenacity and constant drive for results. It has been found that the athletes, who are the first or only children in their families, achieve high results due to intense and hard training, in contrast to the athletes of the second group. Strong correlations between the indicators of communicative emotionality and confidence in achieving the goal, as well as between the leadership potential and the desire for freedom have been revealed in the "second or later-born child" group. Thus, the research problems have been solved, and the goal has been accomplished. The research hypothesis has been confirmed. Psychologists are recommended to use the study results for correction of the athletes' educational and training activities, since this can improve the results of competitions. The long-term objectives of further research are as follows: 1) to identify, describe and explain the mechanisms underlying the patterns we have revealed; 2) to study the sibling position as a factor of athletic performance during training and competitions in elite sports.

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