

## Confounding factors in sport activities of powerlifters

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**Abstract.** Sporting activities are characterized by high physical and psycho-emotional stress. Modern trends in powerlifting are aimed at improving the technical and psychological training, improving physical form improving competition rules. The results of our research work describe the factors that cause of disorganization of powerlifters. 160 athletes going in for in powerlifting take part in the questionnaire to solve the problem. The sample included 80 women and 80 men, aged 16 to 49 years. Results of the study will determine the search for optimal solutions of the confounding factors in powerlifting athletes that in the future will make it possible to increase a sports result of the athletic.

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### Introduction

Dynamically developing sport – powerlifting began in the late 40's – early 50-ies of XX century. At the present stage in such a short period of development in comparison with weightlifting powerlifting circle increases audience of amateurs and professionals. Interest to the sport is explained by the fact that people throughout its existence take strength as an important and necessary physical quality for life.

Sports disciplines powerlifting (squat, bench press and deadlift) are aimed at the development of power base of core muscles of an athlete. It is the specificity of power triathlon in contrast, for example, with weightlifting, which with the help of the rod develops speed-strength qualities of an athlete. I.V. Belsky suggests to regard “technique of powerlifting of movements as a system in which are pointed out isolated relevant structures: 1) dynamic – the interaction of the body with the rod, and 2) the kinematic – the trajectory of the rod, and 3) the rhythmical – the timing relationship of performing of individual components of the exercises, and 4) informational – revealing patterns of relationships between different components of information, such as propulsion systems – installation, which means the athlete's psychological adjustment to perform the activity itself is needed to cast the perfect motion of information will be entrenched in the subconsciousness” [1].

In the process of adaptation to physical activity (training and competition) the athlete's body adapts not only to the quantity to be lifted, but also to change functions, biochemical processes and reactions caused bodily fluids. We should add to this change of psychoemotional background connected with competitive activities. For example, in sports such as weightlifting, powerlifting, and others, at competition emotional state does not only change from attempts to

try, but also in some cases, it is one of the main factors to achieve sporting success [2].

Studies of psychological conditions that impede adequate training and performance at competitions of an athlete, are of fundamental importance. At present there are a lot of studies on the stress factors in various sports: golf [3, 4], football [5], wrestling [6], figure skating [7], swimming [8], athletics [9] and others. Powerlifting in psychological aspect has become the subject of research in the study of psychological types of students-powerlifters [10] and in the analysis of precompetitive emotion [11]. Hitherto confounding factors of confounding factors influences athletes that have a significant impact on the effectiveness of training and competitive activity. These factors prevent optimal implementation of athletes motor (power) problems and psychological functions. They affect different body systems, make high demands for energy exchange and energy services, psychological qualities of athletes, have a negative impact in the performance of competitive actions. Confounding factors are mixed, they bear exogenous and endogenous character and are determined by the conditions of human life [12, 13, 14].

The aim of our study was to determine the importance of confounding factors in training and competitive activities of athletes involved in powerlifting.

### Methods

The methods used in this study: analysis of scientific literature on research, observation, interview, questionnaire.

To determine the effect of confounding factors, we developed a questionnaire, which represents 11 confounding factors and 12th factor is necessary to identify in its own version. Respondents

need to arrange them in order of influence on the athlete. So, assigned to a particular factor a rank # 1 has the largest influence, and the factor under # 11 – the least impact on the athlete.

The novelty of this questionnaire is that it is grouped into many confounding factors single conditions for performing activities violating the coaching process or behavior in contests, and causing changes in the results of sporting activities which are not typical of athlete normal behavior described in the literature. In addition, the social factor was first introduced.

To solve the problem the questionnaire was attended by 160 athletes involved in powerlifting. The sample included 80 women and 80 men, aged 16 to 49 years. Sports experience is from 1 year to 34 years. Sports category is from third youth to master of sports of international class. Such sampling is justified, because it gives you the opportunity to consider in subsequent papers confounding factors from different perspectives: gender, age, skill athlete etc.

Determining the significance of confounding factors and ways to overcome them, proposed by athletes to evaluation was based on the calculation of the arithmetic mean, and then list of confounding factors was ranked (see table).

**Table 1. Hierarchy of confounding factors of powerlifters**

Confounding factors	During training exercises		At competitions	
	rank	GPA (Grade Point Average)	rank	GPA (Grade Point Average)
emotional stress (excitement, bad mood)	IV	6,2	I	4,2
physical fatigue (fatigue, constant trips to the competition)	II	5,2	VII	7,75
refereeing (errors of the secretary weight is not counted, subjectivity in assessing the readiness of the athlete)	–	–	V	6,85
unusual situations (the displacement of the competition, the announcement of the current emergency situation)	–	–	XI	11,41
geographical conditions (other climatic conditions, change of time zone)	VIII	9,2	VIII	7,85
level of competition	–	–	III	5,69
mechanical interference (problems with shells, sports equipment, lack of quality inventory)	V	6,7	IV	6,83
sound effect (phone calls, music, foreign talk, noise from the shells)	VII	7,8	X	8,9
injury	I	3,6	II	4,86
social factors (problems in family relationships, children, housing problems, etc.)	III	5,5	VI	7,47
the human factor (the presence of strangers (not related to sports), a large number of trainees, tips from strangers and other athletes)	VI	7	IX	8,4

## Results

Consider in more detail the first five of confounding factors during training and competitions as the most significant in terms of powerlifters.

### Analysis of confounding factors during exercise

Analysis of the table shows that during exercise the most significant confounding factor is injuries (average score 3,6). In powerlifting an athlete has to deal with large and even extremely high weights that are not in compliance with certain

principles can harm the body. Sickness, injury impact on the overall mobilization readiness of the athlete. Trauma can lead not only to exemptions from 1-2 workouts, but it maybe the whole season, and as a consequence of the inability to participate in the competitions. Unfortunately, the result of the injury during training may be not only improper technique training, but also a violation of the rules of conduct during training by the athlete and overconfidence.

The injured athlete will typically have to cope with the emotions and stress that accompany the worry that an injury may hinder a top performance or worse still prevent them from competing at the biggest event of their sporting career – one that they have trained and made sacrifices for over a number of years [15].

Next in importance are located physical fatigue (fatigue, constant trips to competitions) (5,2). Fatigue – this is a temporary decrease in performance that occurs during exercise or activity in general. This is very dangerous because it can lead to the rejection of the continuation of activities or a significant reduction in its effectiveness. Depending on the specific conditions of muscle activity and the individual characteristics of the body the causes of fatigue may be adverse biochemical and functional changes in the body.

The confounding factor, which took the third place turned out to be very surprising (5,5). It is a social factor (problems in family relationships, children, housing problems, relationships with family, financial difficulties, etc.). This factor has been introduced by the authors (Ljdokova G.M., Razzhivin O.A., Volkova K.R.). In the sports literature, it is not presented as a factor, there are only a few mentions of the complexities of private life that athletes can have in general. Social factor, as we have seen, was one of the most important one. Whatever level athlete has not reached, it is in a certain social environment, which may be close (family, relatives) and conditionally far (pedestrians, society, etc.). Being in a situation of training, people are not distracted from thinking about the problems of children at school or kindergarten, lack of funds for the purchase of food additives and food for the family, etc. And it affects the training process.

The next position in the hierarchy of confounding factors takes emotional stress (6,2). The regular, in our opinion, the fourth position due to the fact that the athlete is only training. At any moment, he can stop it, relax, use less weight or do general physical training. If emotional stress precedes competition, the athlete is able to transform wise excitement in a positive factor. When emotions are interpreted as pleasant, they may facilitate

performance, but, when perceived as unpleasant, they may interfere [16].

The final confounding factor among five ones – mechanical interferences (6,7). This is one of the major problems associated with sports equipment and gear, inventory. All equipment (bench/squat racks, bar, stage) must meet the standards and be roadworthy. This imposes additional obligations on staff. Often athletes prepare to compete with the equipment that does not meet standards, it is impossible to press post successfully, with not sitting suit (suit) or shirt (bench shirt), etc., which also creates psychological discomfort.

Next in order is human factor (7), the sound effect (7,8), geographical conditions (9,2).

As other confounding factors athletes name: absence of a coach or a poor relationship with him, no optimum time for training.

#### **Analysis of confounding factors in the competition**

“Athletes are always searching for possibilities to improve their physical performance in training and especially in competition situations” [17]. Sports competition – a kind of “test” for athletes, this is the result that has been developed by them in training.

Analysis of confounding factors at the powerlifting competition (see table) shows that 1 rank in the hierarchy takes emotional stress (average score 4,2). It should be said that the athletes feeling no prelaunch excitement are rare. Reasons for such excitement and anxiety are: fear of failure, take the team, coach, fear of opponents, the specificity and significance of the competition; readiness to compete, individual typological features of the athlete and etc. Sometimes even the slightest idea about upcoming competitions can lead to changes not only psychologically, but also at the somatic level. On the one hand, this is normal, this alarm – prelaunch phenomenon that described A.TS. Puni [18]. But it has a different shape. Combat readiness and easy prelaunch excitement – the most favorable form. If there is overexcitement, the effect of such a state becomes negative. “For example, in a weightlifting competition, where only a few kilograms decide on whether or not an athlete gets a medal, athletes need strategies to regulate their emotional level in an intended direction directly before lifting the weights to maximize their probability of success” [19].

Next in rank positions are occupied by trauma (4,86). This factor is a leader, both during training and in competition. Injury removes man from the race for the final. This is unacceptable for every athlete. Experienced powerlifters with conscious effort are very often able to overcome the pain and show the highest result, endangering with your body. During

the competition athletes must comply strictly with all safety rules and exercise equipment to avoid injury.

The third position of confounding factors is placed with the level of competition (5,69). The level of competition determines personal and social importance for the athlete to achieve a result. For each athlete – his own ultimate level of competition (depending on experience, sports category, the level of the previous achievements). The more important the upcoming competition for triathletes the greater the level of competition, the easier it is to achieve mobilization readiness. Powerlifter should objectively assess its readiness to compete as his willingness adequate to the task.

The fourth place is occupied by mechanical interference factor (6,83). It has almost equal to the average value and the period of training. First of all, it concerns sports equipment. “Native” equipment, at which athletes train the may be different from other similar both for better and for worse. In training, the athlete feels his post, merges with it together. At competitions it is required extra effort to achieve such unity. At competitions all else (not native): the platform, barbell, bench/squat racks. This factor cannot be but planned: right pad bandages, the use of t-shirts for the bench and bar lying jumpsuit for deadlifts and squats, the correct assessment of their capabilities and custom weights determine the outcome of the competition.

In five of confounding factors in the competition – judging (6,85). This is an external factor, which the athlete cannot influence, but this factor imposes a significant imprint on the state and behavior of a powerlifter. Competition has its own specific characteristics in terms of judging: the manifestation of biased refereeing, incorrect assessment of the actions of an athlete, lack of good steered. In addition, the competition rules are improved in order to increase entertainment wrestling, there are constant changes and additions. This, in turn, causes some athletes need in a short period of time substantially change the entire process of preparing and weighing mode.

In subsequent rank position is located: social factors (7,47), physical fatigue (7,75), geographical conditions (7,85), the human factor (8,4), the sound effect (8,9), non-standard situations (11,41).

#### **Discussion and conclusion**

We have considered the confounding factors are largely interrelated. All environmental aspects of life, including lifestyle, training methodology, family relationships, how to find training partners, precompetitive mode, behavior in everyday life, affecting the competitive performances.

In psychology, there are many techniques, defense mechanisms used in the process of changing human behavior, ranging from Freudian psychoanalysis and ending with modern techniques [20].

In order to improve the reliability of performing at the competition in the training process is necessary to create certain conditions conducive to adaptation to confounding factors, as well as the formation of the athletes powerlifters skills of coping with confounding factors.

Empirical studies allowed us to determine the specificity of young sport – powerlifting, to determine the state of psychological training of powerlifters; to identify undeveloped questions of the problem; to determine the place of confounding factors in sporting activities; to identify ways to further address of the issue.

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