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Gender Aspects of Confounding Factors in the Preparation of Powerlifters

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Powerlifters' sporting activities involve a variety of circumstances preventing them from optimal physical performance. The study of confounding factors, taking into account gender-based approach, allows determining the highest priority position of these barriers for both sexes. In the course of our study we surveyed 160 athletes – powerlifters (80 men and 80 women) from Russia at the age of 16 to 49 possessing various sports skills. This paper analyzes the first three factors that are most significant for men and women in the course of training and competitive activities. The results of the study do not reveal fundamental difference in defining significant confounding factors by male and female powerlifters.

Key words: Confounding factor, Gender, Powerlifting, Training and competitive activity.

Competition is a culminating point in the athletes' activities. Athletes' high achievements depend not only on their perfect physical form. Athletic performance is a synthesis of many components, so the athlete must mobilize all his faculty and power. According Giacobbi, "five key factors contribute to success in cognitive sport: technique, physical condition, psychological state, nutrition, and equipment a determining condition in the athletic career is performance and the results that are achieved" (Giacobbi, 2004). The athlete's body adapts not only to the weight that is to be lifted, but also to the change of functions, biochemical processes and reactions they cause in bodily fluids. Here we should add a change in psycho and emotions, which accompany the competitive activity. For example, in such sports as weightlifting, powerlifting, etc. the emotional state changes from attempt to attempt at the competition, and, in some cases, it is one of the main factors to achieve sporting success (Tobacyk, 2006).

Every event begins long before it starts - with the training process. The key to athletes' successful performances in competitions is correct and well-built training activities, which include physical training and nutrition, equipment, rehabilitation and undoubtedly psychic load. The same can be referred to athletes-powerlifters.

Powerlifting is a relatively young sport, which emerged as an independent discipline in the middle of the 20th century. Athletes demonstrate the power quality in squats, bench press and deadlift. Powerlifting training process, just like in any other sport, cannot always go without a cinch. Any interference can disrupt the athlete's

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emotional and physical balance. "Stress will degrade performance. Under the pressure of an emergency, close examination by others, time urgency, threat of bodily harm, or other strong stressors, people often falter"(Ljdokova, 2014).

The effective sports career as a whole is directly dependent upon the productivity of the training process and athletes' success at the competitions. But sports activities involve a number of obstacles of various kinds preventing the athlete from effective training sessions and successful performance at the competition. In sports psychology to describe the problem such terms as stress, stressor, stress factor are used which, in our view, do not properly and comprehensively reflect the subject matter under study. "The effects that hinder the achievement of high sports results" should be defined as confounding factors in sports activities (Cohn, 1990, Nicolls, 2009).

The problems of confounding factors are studied and represented in a number of works, including fighters' [2], golfers', skaters', football-players', swimmers', athletes' confounding factors and some others (Damadaeva, 2011, Dikaya, 2007, Giacobbi, 2004).

The athlete's psychological training has been developing for more than half a century. Scientists are investigating the circumstances that can prevent the achievement of high sports results even at the training stage. Scientists Puente-Diaz and Anshel have studied the issues of highly skilled Mexican and US tennis-players' acute stress and strategies to overcome it. Besides, Nicholls with a team of scientists studied golf-playing teenagers' stress specific features and ways to overcome it. Professional rugby players' stress and stress-coping strategies were described in the work by Nicholls et al., the same problem with English rugby junior team was considered by a group of scientists – the Nicholls et al (Ljdokova, 2014).

Various stressors and the related possible strategies to address the problem among skippers are considered by Weston et al. Reeves et al. identified common and opposite results in stress and strategies to overcome it among football players in two age groups: younger adolescents (12-14 years old) and middle adolescents (15-18 years old). Research on stress and ways of its solution in basketball was also conducted. Based on the results of work with Olympic champions the research by Sarkar and Fletcher gives an overview of stress and its defensive factors as the basis of athletes' psychological stability. The list of works in this field can be continued, but even this brief survey shows that interest in the problems concerning the confounding factors in sport and strategies to overcome them is increasing. However, few works are related to confounding factors in powerlifting, therefore there is still much to be researched in this field. Consideration of ways to overcome the confounding factors within a particular sport expands the boundaries of athletes' sports performance and increases athletes' productivity in training activities. In this regard, our research has an important place among the works in this direction. The paper's scientific novelty consists in considering and determining the significance of the ways to overcome athletes-powerlifters' confounding factors (Nicolls, 2009).

Examining issues concerning confounding factors within a particular sport provides a possibility to create a perfect training model for the athlete who is aimed at a high result. In connection with this provision, our research takes its place among the works of this direction. The material of this paper complements our previous work, which considered the confounding factors of athletes involved in powerlifting (Ljdokova, 2014).

Modern sport is not only spectacular and attractive; it gives a person a great opportunity for the manifestation of spiritual and physical strength (Goertzen, 1989). Though at present sports activities are held in completely new socio-economic conditions, with the ever-changing environmental conditions, extreme physical exertion, intensive pharmacological support, and increased stress. Most research on confounding factors in sport was held without taking into consideration sexual differentiation or considers the same sex (Hadd, 2007, Holt, 2002).

Man learns the gender differences through the stages of socialization, which he runs through all his life. In this case, gender roles and norms do not have a universal content and vary considerably in different societies (Murphy, 1998). A gender role requires compliance with certain standards (for example, girls are engaged in artistic gymnastics and boys in wrestling and football). In

fact, every sport is gender neutral, since any kind of sport develops one or more of the five athlete's physical qualities with which both men and women are genetically endowed (Holt, 2002). Nevertheless, we must remember that, historically, a sport is exclusively masculine sphere of activity. In particular, men's sport is associated with activities that develop the athlete's strength (Ismailova, 2013). The results of the study show that the most unfeminine "sports include football, hockey, bodybuilding and weightlifting". Powerlifting may as well continue the list. Due to the fact that powerlifting is a non-Olympic and relatively young (the first world championship was held in 1972) sport, it is not as widely popular with the society as bodybuilding or weightlifting. Powerlifting is a strength requiring discipline, in which the athlete's qualification is determined by three barbell exercises: squats, bench press and deadlift (Smirnov, 2013).

METHOD

The study is based on such methods as analysis of the scientific literature on research problem, observation, interview, and questionnaire.

In order to determine the influence of confounding factors on athletes-powerlifters, we developed a questionnaire, which is a list of 12 confounding factors, of which 11 are offered by us, and the 12th factor is designated for the athlete's own option. The respondents placed them according to the order of importance they attach to the factor's influence on the athlete. Thus, a certain factor which is assigned rank # 1 has the greatest impact on the athlete, and the factor # 12 – the least. At the next stage of the research, by comparing the results, the dominant confounding factor for both men and women was identified.

The novelty of this survey is that it gives generalized groups of confounding factors, which include a number of conditions that violate the training process and cause changes in the results of sporting activities. Such changes are not typical of the athlete's normal behavior. Furthermore, the authors introduced social criterion into the first group of confounding factors for the first time.

Professional powerlifting experts and sport psychologists (Prof. A.I. Fukin, Ph.D. in Psychology, Russia; G.V. Khodosevich, Cand. Sc. in Biology, senior coach of Russian powerlifting women's team; B. Le Panse, Ph.D., multiple World and European champion in powerlifting, France) consider the questionnaire to be valid.

Respondents to the questionnaire were 160 athletes involved in powerlifting. The sample included 80 women and 80 men aged from 16 to 49 years old, with the term of sports activities ranging from 1 to 34 years; the survey of participants' athletic skills comprises 3rd, 2nd and 1st junior level, 3rd, 2nd and 1st adult category, candidates for Master of Sports of Russia, some athletes possess the title "Master of Sports of Russia" and "Master of Sports of Russia of World-Class".

The significance of confounding factors proposed to the athletes' evaluation was determined by calculating the mean value. Further on questionnaire materials were ranked (see Table.1. and Table.2.).

RESULTS

Gender analysis of confounding factors in powerlifters' training process

The first three (dominant) positions of powerlifters' confounding factors as the most revealing when considering gender (Table 1) have undergone a detailed analysis.

The analysis of the table shows that during a training session the three most significant confounding factors from men's point of view include injury (2), physical fatigue (4.33), and mechanical interference (4.83). Women's most important confounding factors are emotional stress (2.67), physical fatigue (2.78), and injury (3.89). The confounding factors selected by the respondents suggest that for the athletes professionally engaged in weightlifting, sports activity is a means of reducing gender inequality that exists in society. Not biological sex but gender preconditions the athlete's psychological qualities, abilities, attitudes and values.

Physical fatigue and injuries are inherent characteristics of sporting activities, especially in powerlifting, where the athlete works with near-limit weights and extremely high-weight barbells. It is not by chance that both men and women highlight this factor as one of the dominant. Both men and women run risks for high sports results can be achieved only by increasing training loads.

An increase in the quantity of heavy weight training sessions enhances the elements of risk, increases the number of injuries, overexertion, overtraining and is often accompanied by the athlete's forced departure from the race for a short term during the training session or even from the sport for life. Athletes cannot endure leaving sport (Puni, 1969, Tobacyk, 2006). According to the study, injury incidence of men involved in powerlifting and bodybuilding is higher than that of their female colleagues (3.08 vs 1.90). Thus, the present study shows the differences between male and female athletes doing the same sport. It should be remembered that both men and women in the sphere of sports tend not only to success, but also to fame, and fortune. Therefore, the powerlifters' main tasks at workouts are to curb irrational splashing of the stock of energy, and make some of this energy work responsibly for the development of the athlete's adequate training sessions as well as to develop the athlete's endurance and ability to adapt themselves to the stress, characteristic of the competition (Solovyeva, 2008, Noblet, 2002).

The third dominant factor differs: it is mechanical interference for men and emotional stress for women. This seems to be a natural indicator showing men's rationality and women's emotionality. Men are oriented towards not only psychological training, but also towards technical and tactical training, the spheres where sports equipment plays an important role. Powerlifting equipment is used to protect against injury, with modern production outfit permitting to get an extra boost in the results of each exercise. The use of modern certified equipment in training workshops allows in the homelike situation simulating the situation of the competition, thus achieving maximum results. But experience shows that not all athletes' training equipment in the home country meets the standards recommended by technical regulations of the International Powerlifting Federation (IPF).

Gender analysis of confounding factors in the powerlifters' competitive activity

Participating in a competition of any rank is what any athlete aspires at. This is an opportunity to improve the skills and assess one's spare capacities. A competition is the result of the powerlifter's individual intellectual, psychological, technical and tactical activities and the athlete's

Table 1. Confounding factor hierarchy in training activities

No	Confounding factors	Men		Women	
		Rank	Average score	Rank	Average score
1	Emotional stress (anxiety, low mood)	IV	5.5	I	2.67
2	Physical fatigue (fatigue, constant trips to competitions)	II	4.33	II	2.78
3	Refereeing (secretary's errors, the weight is not counted, subjectivity in assessing the athlete's readiness)	VIII	7.5	X	8.67
4	Unusual situations (offset to the competition start, announcement of emergency)	V	6.33	VI	6.78
5	Geographical conditions (different climatic conditions, change of time zone)	VIII	7.5	VIII	7.33
6	Level of competition	X	8.16	XI	8.88
7	Mechanical interference (problems with sports equipment, lack of high quality equipment)	III	4.83	VII	7
8	Noise (phone calls, music, foreign conversations, the noise from the athletic equipment)	VIII	7.5	IX	7.44
9	Injuries	I	2	III	3.89
10	Social factors (problems in family relationships, problems with children, housing problems, etc.)	VI	6.67	IV	6.22
11	The human factor (the presence of strangers (non-sport), a large number of trainees, advice from strangers and other athletes)	XI.5	8.33	V	6.56
12	Other factors	XI.5	8.33	XII	9.78

personality. Competitive activity is associated with various external and internal confounding factors affecting the athlete.

The analysis of significant confounding factors in men's and women's powerlifting competitions (Table 2) shows that the top three for men include injury (2.16), physical fatigue (4), and emotional stress (4.17); women include emotional stress (2.56), physical fatigue (4.89), and injury (4.89) into the top three. The data of this part of the study are quite different from the training session results. Nevertheless, this is absolute regularity, from our point of view. The influence of confounding factors on athletes, both men and women, is exerted through the impact on the emotional sphere, causing negative experiences, inappropriate behavior and reduced effectiveness. Men and women are characterized by the same tendency: the same type of activity leads to similar changes.

The effects that hinder the achievement of high sports results are considered to be the confounding factors. Foreign scientists indicate these situations as stressors. Following the idea of a Canadian scientist H. Selye that "activities associated with stress, can be either pleasant or unpleasant", we believe that the term "confounding factor" is more accurate, since the term "stress" has a more generalized meaning (Ljdokova, 2014).

Table 2. Confounding factors hierarchy in competition

No	Confounding factors	Men		Women	
		Rank	Average score	Rank	Average score
1	Emotional stress (anxiety, low mood)	III	4.17	I	2.56
2	Physical fatigue (fatigue, constant trips to competitions)	II	4	II,5	4.89
3	Refereeing (secretary's errors, the weight is not counted, subjectivity in assessing the athlete's readiness)	III	6.5	IV	5
4	Unusual situations (offset to the competition start, announcement of emergency)	V	6	VI	6.44
5	Geographical conditions (different climatic conditions, change of time zone)	VII	6.67	VII	6.89
6	Level of competition	VIII	7.5	V	5.56
7	Mechanical interference (problems with sports equipment, lack of high quality equipment)	IV	5	VIII	7
8	Noise (phone calls, music, foreign conversations, the noise from the athletic equipment)	IX	8.17	XI	9.22
9	Injuries	I	2.16	II,5	4.89
10	Social factors (problems in family relationships, problems with children, housing problems, etc.)	X	8.83	IX	7.78
11	The human factor (the presence of strangers (non-sport), a large number of trainees, advice from strangers and other athletes)	XI.5	9.33	X	8.56
12	Other factors	XI.5	9.33	XII	9.44

DISCUSSION

People of any gender experience emotional stress. But it is not an expressive face of emotions but rational, which determines consciousness in relation to the implemented activities (prelaunch excitement), and objective alert connected with the responsibility of the task (to represent one's team, city, and country). In addition, the athlete during the competition must take into account not only the circumstances known to him, but also, if possible, the decisions taken by his rival which he is not aware of (Gould, 1983, Gould, 1993).

Physical fatigue associated with competition, inadequate requirements for the executable weights, and the desire to achieve the best success, unfortunately, can lead to a significant reduction in the athlete's strength. The coach's main task during this period is to organize

the athlete's adequate rhythm of the competitive process, taking into account individual features, and the athletes' task is to use the self-control skills, adjusting themselves to the situation (Ljdokova, 2014).

For both men and women, a serious confounding factor in the competition is injury. In powerlifting the athlete may injure shoulders, spine, elbow and knee joints which are risk factors for both sexes (Shulmin, 2013). Personal injuries include various strains and sprains. In this situation it is necessary to take into account the physiological characteristics of the athlete's sex. Firstly, women have to expend more energy than men in those sports that are both feminine and masculine. Secondly, women's joints, especially elbow joints, are less strong than men's; therefore women are more likely to be injured in sports that they share with men. Particularly dangerous for women are injuries associated with the damage of the hip joint. Using sport equipment (bandages on the knees, a special suit for squats and deadlift, and a shirt for bench press exercise) can reduce the risk of injury during the exercise; although the use of such equipment is associated with significant pain and skin and muscle micro traumas. It is undoubted that the athlete must not ignore the physical state, follow basic safety rules, and obey the coach<.

CONCLUSION

The research in the field of powerlifting confounding factors revealed that there are no fundamental differences in defining significant confounding factors by men and women. The slight difference detected in the ranks of other factors can be explained by either gender or sex characteristics. A number of researchers believe that doing masculine sports results in women's more powerful anxiety concerning the sex-role conflict. Women athletes are trying to overcome this conflict by "improving" their femininity in other areas – clothes, makeup, etc. (Romanova & Grebennikov, 2009). The athlete's identity should be considered as a complex of congenital and acquired qualities. The athlete's inherent features are taken into account when forming personality traits that are professionally important in a particular sport.

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