Comparison of Mental Toughness and Sense of Coherence in Natural and Steroid Bodybuilders

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Abstract

Objective: Bodybuilding has attracted a lot of people in recent years, but despite the popularity of using unauthorized and steroid drugs, it has caused many problems for athletes. The purpose of the present study was therefore to compare mental toughness and sense of coherence in natural and steroid bodybuilders.

Method: This study was a descriptive and causal-comparative study. The statistical population consisted of both natural and steroid bodybuilders in Rasht in 2019 from whom 120 individuals (60 natural bodybuilders and 60 steroid bodybuilders) were selected purposefully who answered the questionnaires of Sheard, Golby & Van Wersch's (2009) Sports Mental Toughness and Antonovsky's (1993) Sense of Coherence. Data were analyzed using multivariate analysis of variance by SPSS 24 software.

Results: The findings of this study showed that there was a significant difference between the components of mental toughness and sense of coherence in the two groups ($P<0.01$). Natural bodybuilders had higher levels of Confidence (24.93, $P<0.001$), Constancy (15.60, $P<0.006$), Control (14.43, $P<0.001$), and sense of coherence (21.88, $P<0.001$) compared to steroid bodybuilders.

Conclusion: The results obtained from this research show that the abuse of steroid drugs has a significant impact on the psychological and physical aspects of bodybuilders. For this purpose, it is necessary to prevent possible injuries by providing proper information and providing psychological services to professional athletes.

Keywords: Mental Toughness, Steroid Bodybuilding, Body image, Sense of Coherence, Natural Bodybuilding.

Introduction

Bodybuilding is a sport in which the bodybuilder, during a period of intensive training, which includes special dietary and supplementary diets, works out to increase muscle mass and then dry and shape it (Spendlove et al., 2015). Increasing and improving performance through drugs and substances is common among athletes, especially bodybuilders around the world (Sagoe, Molde, Andreassen, et al., 2014). In this regard, anabolic-androgenic steroids are one of the most common illicit drugs for increasing strength and rapid muscle growth among bodybuilders (Thevis, Kuuranne & Geyer, 2019), which are much more widely used in men (6.4%) than women (1.6%) (Sagoe et al., 2014). Hussain, Khalily, Rehman, et al. (2019) In a study examined the prevalence of steroid drugs and related psychological effects. The results showed that 49% of bodybuilding athletes had a history of using these drugs and more than half of them went to steroid medications at the suggestion of their friends. Anabolic-androgenic steroids are derivatives of the hormone testosterone that are taken orally or by injection and if used by athletes, are considered defective anti-doping rules (Thevis et al., 2019; Shojaei, Shamsipour, Dehkordi & Mootabadi, 2018).

Steroids have two types of anabolic and androgenic

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effects on consumers: the androgenic effect is the development of secondary sexual characteristics and the anabolic effect is the development of body muscles (Niedfeldt, 2018). Steroid drug abuse has a wide range of side effects including; Acne is associated with skin rash, infertility, gynecomastia, aggression, hair loss, and hair growth, liver problems, testicular atrophy, thickening of the voice and clitoral hypertrophy, with liver damage accounting for the largest share (Albano et al., 2021). Studies have shown that the use of some of these substances, such as anabolic steroids, in addition to their dangerous side effects on personal health, can be the basis or introduction to the use of other substances such as drugs and alcoholic beverages. Trend count. On the other hand, high consumption of these drugs is associated with a wide range of side effects including acne, gynecomastia in men, heart attack, and liver disease (Liu & Wu, 2019), and in women causes muscle, reduce breast size and body fat and rough skin. And with continued use of steroids, some of these side effects will be irreversible (Nieschlag & Vorona, 2015). Consumption of these substances during adolescence causes rapid growth and then stops the growth of bones and finally can cause short stature (Mullen, Whalley, Schifano & Baker, 2020). Due to the use of non-sterile methods and common needles for the injection of these substances, consumers are usually exposed to hepatitis, AIDS, and bacterial endocarditis and the formation of abscesses in soft tissue (Pope, Khalsa & Bhasin, 2017).

One of the important factors for success and progress in sports is the ability to maintain the desired level of performance in the conditions of a competition (Clough, Earle & Sewell, 2002; Shabahang et al, 2020). In these cases, the athletes' responses determine the degree of success or failure, which largely depends on the psychological factors of the athletes (Madrigal, Gill & Willse, 2017). It seems that mental toughness, which is often due to its role in reinforcing adaptive responses, is an important factor in classifying pressures, situations, and events positively and negatively (Sheard, Golby & Van Wersch, 2009). In this regard, the results of studies conducted on athletes in recent years have also shown that one of the prerequisites for success in many professional and competitive sports is mental toughness (Gucciardi, 2017 & Sheard, 2012). Gucciardi (2017) describes mental toughness as a flexible, efficient, and safe psychological state that leads to the stability of long-term goals in individuals. In other words, athletes with mental toughness are very motivated and determined to achieve their success and goals, despite all the inconveniences and failures. Its core concept is in psychological traits that include self-confidence, stability, control, mental skills, resilience, and the ability to succeed in difficult situations (Crust, 2008; Bagheri Sheykhangafshe, Abolghasemi & Kafi Masouleh, 2021). In general, mental toughness acts as a protector in which psychological resources help people in a variety of areas to succeed in ultimately achieving good mental health (Drinkwater, Dagnall, Denovan & Parker, 2019). In this regard, the obtained evidence has shown that athletes of different disciplines are placed at different levels by mental toughness. It can be acknowledged that athletes with mental toughness differ from other individuals (Chen & Cheesman, 2013). The results of sports studies have shown that various psychological factors such as self-esteem, stress management, and mental toughness play a decisive role in the success and improvement of athletes' performance (Wilson, Bennett, Mosewich, Faulkner & Crocker, 2019). To this end, Algani, Yuniardi & Masturah (2018) in a study examined the mental toughness and competitive anxiety in athletes; Based on the results, mental toughness and competitive anxiety had a significant negative correlation with each other, and athletes who had higher mental toughness experienced less anxiety in competition conditions. It can be said that athletes who have good mental toughness use more effective coping strategies in

stressful and sensitive situations and try to achieve their goals regardless of the leading problems (Beckford, Poudevigne, Irving & Golden, 2016). Success and progress in sports are not only achieved by physical factors, but also by a combination of several psychological factors (Kim, Kim, Newman, Ferris & Perrewé, 2019; Endo, Kanou & Oishi, 2012). The conclusion is another psychological variable that can play a decisive role in the performance of bodybuilders. According to Antonovsky's theory of health (1993), every human being has many sources of resistance to stress and the pressures of life, which, if necessary, are used to deal effectively with these stresses. The size of these resources varies according to the personal characteristics of individuals, which can include the perception of reasoning, problem-solving, strategies, financial capacity, and social and cultural factors (Kukihara et al., 2018). The possibility of using these resources correctly depends on people's sense of coherence (Lindström & Eriksson, 2006). A strong sense of coherence is an important factor in facilitating and promoting a person's health, and the higher a person's grades on the sense of well-being, the better their physical and mental health (Eriksson & Lindström, 2007). In other words, the stronger a person's sense of coherence, the more likely he or she is to refrain from engaging in unhealthy behaviors (Eriksson, Kerekes, Brink, Pennbrant & Nunstedt, 2019).

In this regard, research by Lindmark, Stegmayr, Nilsson, Lindahl, and Johansson (2005) showed that athletes with a higher sense of coherence had healthier eating habits, exercised regularly, and performed best. In contrast, people with a low sense of coherence were indifferent to their diet and did not use a proper diet. In another study, Posadzki, Stockl, Musonda, and Tsouroufli (2010) emphasized the importance and role of coherence in increasing health-seeking and psychoanalytic research behaviors. In this regard, the results of many studies indicate the relationship between the coherence of quality of life (Galletta et al., 2019), hope

(Ziolkowski et al., 2016), positive thinking (Öztekin & Tezer, 2009), and health and fitness (Szczepanska-Klunder & Lipowski, 2014). Lindstrom & Erickson (2006) and Erickson & Lindstrom (2007) found that people with a high level of coherence experienced less stress and anxiety in their lives and a positive correlation between them. There is a sense of coherence and quality of life and psychological well-being that increases people's health and hope. In a study of bodybuilders, Mackenzie, Hodge & Boyes (2011) found that successful athletes were psychologically more stable than others, using effective coping strategies. They have lower levels of stress and anxiety and have a good sense of humor. In their research, Szczepanska-Klunder & Lipowski (2014) found a positive correlation between a sense of coherence and fitness orientation in bodybuilding athletes and other sports. From these findings, it can be concluded that the combination of behaviors that improve health and fitness will lead to an increase in a sense of coherence in individuals.

Due to limited studies and not highlighting the study of mental toughness and sense of coherence in natural and steroid bodybuilders; also, the physical and psychological effects of drug abuse on athletes are of great value and importance. Therefore, this study aimed to compare the mental toughness and sense of coherence in natural and steroid bodybuilders in Rasht in 2019.

Method
Population and participants
This research is a descriptive causal-comparative study and was conducted to investigate the mental toughness and sense of coherence in natural and steroid bodybuilders in Rasht. The statistical population of the present study includes all men who have worked in the field of bodybuilding in the official clubs of Rasht. To calculate the sample size, version 3, 1, 9, and 2 of G * Power software was used (Faul, Erdfelder, Lang & Buchner, 2007). The sample size

was 50 people in each group, which accounted for 60% in each group, including a 15% drop. A steroid has been used in the last two years, personal satisfaction, no use of steroids, and the age range of 18 to 35 years have been the criteria for entering the study. Criteria for leaving the research also include; Lack of 5 years of bodybuilding experience, A chance to answer questions, and Drop-in questionnaires. To collect the data, first, the clubs where the consumption of steroid drugs is high were identified and initial coordination was made with the respected officials of the fitness clubs. Then, to collect information, the bodybuilders who used steroids and the athletes who exercised naturally were purposefully selected, and the purpose of the study was fully explained to them, and so on. With the permission of the relevant instructor, they were asked to complete the research questionnaires carefully and not leave the question as unanswered as possible. Each subject completed the individual mental toughness questionnaires of Sheard et al. (2009) and Antonovsky's (1993) Conclusion individually for approximately 15 to 20 minutes.

Ethical statements

The present study was conducted with the agreement of principles and code of ethics (IR.GUMS.REC.1398.121) from Guilin University of Medical Sciences. For the sake of confidentiality, bodybuilders were assured that the information obtained from the research would be analyzed as a group and that their personal information would remain strictly confidential.

Measures

1. Sport Mental Toughness Scale

To evaluate the Mental Toughness of bodybuilders, the scale of Mental Toughness of Sheard et al., (2009) was used. The questionnaire is a self-assessment scale consisting of 14 items (material) and three factors that include thoughts and knowledge related to confidence (versus lack of confidence), stability (versus lack of determination), and control (versus distress). It hurts. The answer to each item is based on a five-point Likert scale. The minimum and maximum scores in this questionnaire are 14 and 70, respectively, with greater mental toughness. This questionnaire was designed based on the concept of mental toughness from the perspective of positive psychology of 'mindset'. This perspective focuses on people's ability to overcome adversity and growth and prosperity in all walks of life, including self-confidence, commitment, perseverance, and emotion management (Sheard, 2012). However, in the conceptualization and measurement of mental toughness by Sheard (2012), a positive psychological framework has been used, which emphasizes flexibility and growth at all levels of competition and skill. This framework more accurately covers the multidimensional nature and complexity of this structure. The Sheard et al. (2009) Scale had appropriate psychometric characteristics based on a sample of appropriate size and its three factors (reliability, stability, control). The validity and reliability of this tool have been fully verified. Cronbach's alpha coefficient was obtained for the subscales of the reliability scales of 0.80, the stability of 0.74, and the control of 0.71 (Sheard et al., 2009). Domestically, Bagheri Sheykhangafshe, Abolghasemi & Kafi Masouleh (2019) stated in their research that the Cronbach's alpha of this scale in its components was 0.79 to 0.89. In the present study, Alpha Cronbach was found to be suitable for a full scale of 0.87 and subscales of 0.83, stability of 0.86, and control of 0.80.

2. Sense of Coherence Scale

Antonovsky's (SOC) sense of coherence (SOC) was used to measure the amount of bodybuilding. Antonovsky's sense of coherence was made in 1993 and has 16 phrases. Every subject responds to this scale rarely, sometimes, and often. The minimum and maximum scores of this scale are 14 and 42, respectively. The alpha coefficient of this scale is reported to be 0.82. The correlation coefficient

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between the short and long forms of the scale is a significant sense of coherence (r = 0.74). Internally, Mohammad Zadeh, Pour Sharifi, and Alipour (2010) examined the psychometric properties of version 13 of this questionnaire. The internal consistency test showed that all 13 cases had a very high correlation with the overall score. Cronbach's alpha was also 0.77, which is 0.75 for men and 0.78 for women. In the present study, Cronbach's alpha coefficient of the questionnaire (α = 0.82) was obtained.

In the present study, descriptive and inferential statistics were used to analyze the data. The

were used to calculate the frequencies and draw tables, and in inferential statistics, multivariate analysis of variance was used. The significance level for all hypotheses was considered to be less than 5%. The SPSS software version 24 was also used to analyze the data.

Results

The statistical population statistics of steroid and natural bodybuilders.

As shown in Table 2, it can be seen that the research variables have a normal distribution, so a multivariate

Table 1. Descriptive statistics of demographic variables of research participants

	Steroid Bodybuilders		Natural Bodybuilders	
Marital status	Frequency	Percentage	Frequency	Percentage
Single	39	65.0	37	61.6
Married	21	35.0	23	38.4
Age (year)	Frequency	Percentage	Frequency	Percentage
18-25	21	35.0	18	30.0
26-30	28	46.6	32	53.3
31-35	11	18.4	10	16.7
Education	Frequency	Percentage	Frequency	Percentage
Diploma	11	18.4	12	20.0
Associate Degree	14	23.3	16	26.6
Bachelor	26	43.3	21	35.0
Master Degree	9	15.0	11	18.4

Kolmogorov-Smirnov test was used to normalize data distribution and the Levine test was used to homogenize the variances to allow the use of parametric tests. In this study, descriptive statistics

analysis of variance can be used. Before presenting the results of this test, its defaults were tested. The results showed the assumptions of homogeneity of variance (P>0.05), homogeneity of covariance

Table 2. Descriptive indicators of research variables including mean, standard deviation, and results of the Kolmogorov-Smirnov test (K-S Z) to check the normality of research variables

Variable	Group	M	SD	K-S Z	P
Confidence	Natural Bodybuilders	24.93	3.64	0.115	0.054
	Steroid Bodybuilders	17.93	5.01		
Stability	Natural Bodybuilders	15.60	3.21	0.106	0.085
	Steroid Bodybuilders	14.05	2.85		
Control	Natural Bodybuilders	14.43	2.96	0.118	0.079
	Steroid Bodybuilders	10.95	3.47		
Sense of	Natural Bodybuilders	21.88	4.54	0.245	0.081
Coherence	Steroid Bodybuilders	18.43	4.67		

(F=1.49, P>0.133), and adequacy of correlations (χ2=59.197, P=<0.01), Are established; therefore,

changes in the sense of coherence due to changes in the two groups.

Table 3. Results of multivariate analysis of variance test related to the difference between the two groups in mental toughness and sense of coherence

Test	Value	F	df	P	Effect Value
Pillai's effect	0.464	24.854	4	0.001	0.464
Wilks Lambda	0.536	24.854	4	0.001	0.464
Hoteling trace	0.864	24.854	4	0.001	0.464
Roy's largest root	0.864	24.854	4	0.001	0.464

the use of parametric tests is unrestricted.

According to the results obtained in Table 3, the F-statistic of multivariate analysis of variance examines the differences between groups in mental toughness and sense of Coherence at the level of 0.01 (Wilks Lambda= 0.53, F = 24.854, P=<0.001). The effect size obtained also shows that 46% of the variance related to the difference between the two groups is due to the effect of dependent variables (confidence, stability, control, and sense of coherence). One-way analysis of variance was used to determine in which of the variables the groups differed from each other. Table 3 reports a one-way

Discussion and Conclusion

The overall purpose of the present study was to compare the mental toughness and Sense of Coherence in natural and steroid bodybuilders in Rasht in 2019. The results showed that there was a significant difference between the components of mental toughness (confidence, stability, control) in the two groups. In other words, natural bodybuilders had more mental toughness than steroid bodybuilders. These results are in line with the studies of Madrigal, Gill, and Willse (7); Gucciardi (2017); Sheard (2012); Drinkwater et al. (2019); Wilson, Bennett, Mosewich, Faulkner, and Crocker (2019).

Table 4. Results of one-way analysis of variance test related to the difference between the two groups in mental toughness and sense of coherence

Variable	SS	df	MS	F	P	Effect Value	Effect Size
Confidence	1470.01	1	1470.01	76.43	0.001	0.393	1
Stability	72.07	1	72.07	7.79	0.006	0.062	1
Control	364.02	1	364.02	34.93	0.001	0.228	1
Sense of Coherence	354.07	1	354.07	18.76	0.001	0.137	1

analysis of variance.

According to Table 4, F-statistic is significant for confidence (76.43), stability (7.79), control (34.93), and sense of coherence (18.76) at the level of 0.001. These findings indicate that there is a significant difference between the two groups in these variables (P<0.001). This means that natural bodybuilders had more mental toughness and a sense of coherence than steroids. Also, the effect size indicates that 39% of the changes in confidence, 06% of changes in stability, 22% of changes in control, and 13% of

In explaining these findings, it can be acknowledged that bodybuilders who exercised naturally had high stability during their professional sports and tried to achieve their ideal body by doing the right exercises and with a plan. To achieve. An athlete can perform well when he or she chooses the right program and moves forward accordingly. Meanwhile, steroid bodybuilders tend to gain muscle very quickly, which is why they are at high risk and take high doses of steroid drugs, which indicate control and Low stability of bodybuilders (Hussain et al., 2019; Mhillaj et al.,

2015). The psychological aspects of athletes' health and performance have received special attention in the last two decades, most of which are related to mental toughness (Gucciardi, 2017; Sheard, 2012). In this regard, Beckford, Poudevigne, Irving, and Golden (2016) investigated the relationship between mental toughness and coping strategies in speed runners. The results of this study showed that professional athletes in more sensitive situations used more effective coping strategies than beginner athletes and also had good mental toughness. On the other hand, Crust (2008) in a study of professional athletes states that people with good mental toughness have a better interpretation of experiencing positive and negative emotions, including competitive anxiety. They were, they were. They were well adapted to the conditions created and tried not to be influenced by environmental conditions and others and to show the best performance. In a large-scale study, Madrigal et al. (2017) examined 570 athletes. The researchers found that athletes who had good mental toughness often used action-based coping strategies. It can be said that mental toughness is a good and strong predictor of effective coping styles and problem-solving. It has also been suggested that training mental toughness can be an approach to increasing athletes' coping efforts. Wilson et al. (2019) in their study examined the role of mental toughness and self-development in increasing and improving the performance of athletes; the findings of this study showed that mental toughness and self-efficacy had a significant positive correlation with each other, which indicates that athletes who have good mental toughness have a more positive view of themselves and the future. The result is success in sports and mental health. In another study, Clough, Earle, and Sewell (2002) compared mental toughness in beginner and professional athletes. The results showed that athletes with higher mental toughness compared to their opponents had a positive mindset. They had the advantage of distancing themselves from their rivals. On the other hand, the findings of this study show that there is a significant difference between the

senses of coherence in the two groups. In this regard, it was found that steroid bodybuilders gained less cohesiveness compared to natural bodybuilders. Results of Endo, Kanou, and Oishi (2012); Lindström and Eriksson (2006), Eriksson and Lindström (2007), Galletta et al. (2019), Szczepanska-Klunder and Lipowski (2014), Mackenzie et al. (2011), and Kukihara et al. (2018) agree with the present study. Explaining these findings, it can be said that taking anabolic-androgenic steroids causes a lot of emotional changes in bodybuilders and can lead to short periods of depression and anxiety for athletes. In the meantime, having a strong sense of coherence is good support for athletes. A sense of coherence is a general orientation in which a person develops the feeling that stressful situations are predictable and controllable, and that there are resources available to deal with these problems that depend on effort and perseverance (Kukihara et al., 2018). In this regard, the results of studies by Galletta et al. (2019) show that the sense of Coherence is one of the important factors in improving the quality of life of individuals. Also, those who show a high sense of coherence in life are less likely to get the disease and have better psychological health in the future. Kim et al. (2019) also examined the feeling of coherence and purpose in life in athletes in a study. The results showed that athletes who had more sports experience had a more coherent goal in life compared to other people. They were. This indicates an increase in a person's sense of coherence through his psychological state and continuous sports activities.

On the other hand, Ziolkowski et al. (2016) studied the effect of regular exercise on life satisfaction and youthfulness; the findings showed that people with good physical activity scored high on a sense of coherence and were more optimistic about life and the future. In a study, Öztekin and Tezer (2009) examined the role of cohesion and physical activity in predicting positive or negative thinking; the results showed that people who are physically active and have a good sense of coherence have a more positive

outlook on life and see the problems and obstacles that arise in life as an opportunity and a challenge. They can successfully cross this path through perseverance and effort. In their study, Szczepanska-Klunder and Lipowski (2014) also found a positive significant correlation between a sense of coherence and fitness orientation in bodybuilding athletes and other sports. From these findings, it can be concluded that the combination of behaviors that improve health and fitness will lead to an increase in a sense of Coherence in individuals.

In the end, the present study, like many other studies, had several limitations that may have affected the results of this study. For example, the lack of cooperation of some bodybuilders to participate in this type of research, along with low reporting of the use of these drugs can play an important role in estimating the correct use of anabolic-androgenic steroids. On the other hand, the statistical population of this study consisted of male bodybuilders in Rasht in 2019. Therefore, caution should be exercised in generalizing the results to women and other age groups and other areas. Therefore, it is suggested that similar studies be conducted in other gender groups (women) and other age groups, especially adolescents and young people. Other research limitations include being limited to self-report questionnaires. Experimental studies such as brain imaging and blood tests can be very helpful in identifying and explaining the effects of steroids on bodybuilders. Also, longitudinal and cross-sectional studies of the long-term effects that these drugs have on a person's physical and psychological functioning can be very useful.

In general, according to previous research and the results of this study, it can be said that bodybuilders who used steroid derivatives had less mental toughness and a sense of coherence than natural bodybuilders. Also, because the abuse of steroid drugs will cause irreparable damage to bodybuilders, it is recommended that sports coaches and psychologists pay more attention to the abuse of steroid drugs among young people and by holding classes and Workshops for the target community (athletes, bodybuilders, young people) will increase people's awareness in this area so that the psychological and physical damage of the leader can be significantly reduced.

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