Original Article

Cognitive Correlations and Psychological Morbidities of Doping in Adolescent Athletes in Kermanshah, Iran

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Objective: This study aimed to determine the relations between cognitive variables (self efficacy, locus of control, and dysfunctional attitudes) and psychological morbidities with using doping agents in adolescent athletes.

Methods: We conducted a case-control study in Kermanshah among adolescent athletes using 50 athletic drug users with reported use as a case group and 50 athletic nonusers and 50 nonathletic nonusers as controls that were matched on salient demographics. Controls selected by a simple random sampling. They were then studied by self-efficacy questionnaire, locus of control scale, dysfunctional attitude scale, and general health questionnaire. Hypotheses tested by variance analysis and Tukey's test.

Results: Our findings showed that athletic drug users had a lower self-efficacy, more dysfunctional attitudes, and exhibited external locus of control rather than control groups. They were also more sensitive to psychological morbidity. Most of relations were statistically significant.

Conclusion: Our findings were in accordance with the theoretical basis of cognitive psychology and they are comparable to most of the similar studies.

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Keywords: Adolescent Health • Athletes • Doping • Drug Abuse • Iran • Kermanshah

Introduction

Anabolic Androgenic steroids (AAS) are a group of drugs including male hormone testosterone and a group of synthetic equivalents of testosterone produced first time in 1940s. Although AAS may be medically prescribed to the patients, they are sometimes used to improve performance or body appearance by healthy persons (1). It is estimated today that 1 to 3 million American athletes have been using AAS illegally (2,3). Using AAS is not limited to US. It has been shown that anabolic drugs used in Canada, UK, Sweden, Australia, South Africa and the others as well (4).

Drug use is not uncommon among high school students and in amateur athletics is of significant concern nowadays (5,6). Many substances are being used by youths commonly without recognizing any risks of such drugs (7). Estimates for the use of drugs among bodybuilders are between 50 to 80 percent (1). Other athletic drug users are usually involved in activities requiring maximum strength and power like track and field, weight lifting, wrestling, and those who are engaged in uncommon high intensity training intervals and serious competitions.

Beyond sport performance or body appearance improvement, other important factors contributed to adolescents' susceptibility to risky behaviors like drug use include: personality traits, body-image impairments, mood changes, and some cognitive variables (including feeling low self-efficacy, external locus of control, and dysfunctional attitude) (1,8,9). Note that wrong perception about risky behavior; end in underestimate danger of drug use by adolescents (1,10).

Control feeling over the daily events is one of the most important processes in dealing with our environment and other people. Control is generally referred to our perceived or real abilities to determine the consequences of an event (11). Efficacy means having a control over the environment which is a pleasant and

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supportive feeling. Bandura (1986) has defined it as a "person's judgment about his ability to do a certain task or to adjust to a certain situation"; the importance of the person's judgment about his efficacy lies in the fact that it plays an important mediating role in the person's behavior (12,13).

Cognition refers to the person's thoughts and interpretations about events or his/her relationship to them. Cognitive abilities can affect our understanding from a stressful situation. For example if an athlete considers losing the championship as equal to failure, the resulting stress will probably be greater than the time she/he doesn't believe so. Therefore it is not surprising that a person's interpretation of events can impact helplessness cognitively regarding his attribution styles (controllable vs. uncontrollable).

As Seligma said attribution styles can conduct helplessness to depression respecting which aspects have been implemented; when one encounters failure in life, attributing it to internal factors in a persistent and general form (e.g. I always fail), compared to the external factors (difficulty of assignment), in a transitional, unstable or specific form, leads to more frustration, and finally depression (11).

Dysfunctional attitudes have been potentially linked to risky behaviors and generally related to the underlying structure of depression and anxiety from a cognitive viewpoint. These attitudes could disturb the person's morale and humor, cause cognitive imbalance and result in psychological morbidity (1).

Exactly, few studies have been carried out on adolescents doping in Iran and little empirical knowledge existed about psychological aspects of adolescents' drug use (14). So we aimed to study psychological correlations of athletic drug use in adolescents.

Materials and Methods

Subjects:

We investigated 150 adolescents that comprised a case group of athletic drug users and two control groups of athletic nonusers and nonathletic nonusers in a case-control study that each group contained 50 male between 11 to 20 years with mean of 16.9±1.3 years. Participants were matched in dyads, based on salient demographics including age, sex, grade, and social class. Controls selected based on a simple random sampling method and cases were chosen among athletes in various gyms and bodybuilding clubs of Kermanshah, west of Iran.

Instruments:

1. General Self-Efficacy Questionnaire (GES) was developed by Sherer and colleagues (1983) and consists of 23 articles as false/true, 14 of which have been written inversely to minimize the effect of the tendency to agree with the items. The sum of scores is 23 and higher score means greater understanding of one's abilities, and vice versa. Validity and reliability of this measure are 0.65 and 0.78 respectively (15).

2. Rotter's Internal/External Locus of Control (LOC) contains 29 items in pairs that the cases answer as self-assessment. Six items are neuter to which no scores are given. Theoretically the scores range from 1 to 23 that higher score implicated in more external locus of control. The mean multiplier of the reliability of this scale is 75%, and its construct validity stands high (15).

3. Dysfunctional attitude scale: This scale was designed by Beck and Wiseman (1978) based on Beck's cognitive theory about depression and anxiety. It contains 40 phrases for which the cases choose their beliefs based on a 7 rating scale from complete agreement to complete disagreement. Theoretically the scores range from 40 to 280. In different studies the means for healthy people have been reported from 119 to 128; the higher scores showing vulnerability to depression (16). Beck, et al have reported the reliability of 89%, as such Rahmani and colleagues' report shows a validity of 87% in Iran (16).

4. General Health Questionnaire-28 (GHQ –28) was introduced by Goldberg, et al (1972) and contains 4 subscales that each containing 7 questions assessing Somatic Symptoms, Anxiety/Insomnia, Social Dysfunction, and Severe Depression. The traditional GHQ score is delivered by scoring a Likert scale with weights assigned to each item. Sensitivity, specificity and the total amount of classified error for

this questionnaire have been respectively 88, 78, and 19 percent. Test-retest reliability has been demonstrated to have a coefficient correlation (r) of 0.90 (17). Total GHQ scores typically correlated with outcome scores from psychiatric structured interviews in the range of r = 0.65-0.70 (18).

All athletes were approached for study inclusion. Students and parents provided written consent. Two clinical psychologists and a physician interviewed and administered four distinct questionnaires to all participants.

According to the nature of the variables, comparisons were made by the Tukey's test and analysis of variance. The significance threshold used was $p< 0.05$.

Results

ANOVA results of the score variances obtained from the self - efficacy questionnaire showed significantly lower self efficacy feeling in athletic drug users at a confidence level of 95% ($p< 0.001$).

Summary of the results of the analysis of variance of the self-efficacy scores has been presented in Table 1.

Table 1. Summary of the Unilateral Analysis of Variance of the Scores of Self-Efficacy Questionnaire

Sources of Variation	Sum of Squares	Degree of Freedom	Mean of Squares	F
Inter-groups (b)	580.813	2	290.3065	19.25
Intra-groups (w)	2217.88	147	15.088	
Sum	7798.693	149	305.494	

Tukey's test finding to compare means of three groups from the self-efficacy questionnaire showed that the difference between the scores in each paired groups (athletic drug users vs. nonusers and athletic drug users vs. nonathletic nonusers) was respectively significant at the confidence level of 99 percent [q (1%, 3, 147) = 5.06] and 95% [q (5%, 3, 147) = 3.68] .

Analysis of variance showed that there was a significant difference between the groups' scores of the locus of control indicative for external locus of control in athletic drug users at a confidence level of 99.90% ($p<0.001$).

Summary of the results of the analysis of variance of the scores of the loci of control has been presented in Table 2.

Table 2. Summary of the Unilateral Analysis of Variance of the Scores of Self-Efficacy Questionnaire

Sources of Variation	Sum of Squares	Degree of Freedom	Mean of Squares	F
Inter-groups (b)	179.573	2	89.786	8.86
Intra-groups (w)	1489.26	147	10.131	
Sum	1668.833	149	99.917	

In this way, results of Tukey's test demonstrated that the difference between athletic drug users vs. athletic nonusers was significant at a confidence level of 99% ($p<0.01$). However, the difference between athletic nonusers vs. nonathletic nonusers was not significant at any level [q (3,147) = 2.04, $p<0.05$].

As such, variance analysis on the scores of general health questionnaire

(GHQ–28) showed that athletic drug users were poorer in psychological health rather than athletic nonusers and nonathletic nonusers at a confidence level of 99% ($p<0.001$) and findings of Tukey's test demonstrated that the difference of mean scores of athletic drug users vs. athletic nonusers was significant at a confidence level of 99% ($p<0.01$), but the difference between athletic nonusers vs. nonathletic nonusers was not significant at any level [q (3,147) = 3.02 and $p<0.05$).

Summary of the analysis of variance of general health has been presented in Table 3.

Table 3. Summary of the Results of Unilateral Analysis of Variance of the Scores of GHQ-28

Sources of Variation	Sum of Squares	Degree of Freedom	Mean of Squares	F
Inter-groups(b)	11219.88	2	5609.93	23.31
Intra-groups(w)	26156.26	147	177.934	
Sum	37376.14	149	5787.874	

Regarding GHQ subscales, athletic drug users reported more physical symptoms, anxiety and depression symptoms, sleep disturbances and lower social efficacy than athletic nonusers and nonathletic nonusers. Also athletic nonusers compared to the non-athlete group, had less psychopathology in the four scales mentioned above.

Finally, the result of the variance analysis demonstrated dysfunctional attitudes were higher in athletic drug users significantly at a confidence level of 99% ($p< 0.001$).

Summary of the analysis of variance of

dysfunctional attitudes has been presented in Table 4.

Table 4. Summary of the Results of Unilateral Analysis of Variance of the Scores of Dysfunctional Attitudes

Sources of Variation	Sum of Squares	Degree of Freedom	Mean of Squares	F
Inter-groups(b)	25794.974	2	12897.487	23.29
Intra-groups(w)	813403.36	147	553.763	
Sum	107198.334	149	13451.251	

In addition the result of the Tukey's test to compare the means of the three groups in this respect showed that the mean differences between each paired groups at the confidence level of 99% was significant [q (3,147) = 4.91 $p<0.01$].

Discussion

The results of this study showed that athletic drug users were significantly different from the nonusers with regard to the cognitive variables. They had lower self-efficacy feeling and didn't belief so much in their abilities to overcome stress and achieve success. A possible explanation for this difference would be a previous failure producing a negative feedback for this group of athletes which in turn lead to a lower sense of control and capability. Any poor performance and loss history may accompany with low self-awareness that in turn result in negative affection and approach to performance enhancing substances (i.e., doping agents) (19-21). These findings are in accordance with theoretical positions of Bandura (22,23). It is concordant with the results of other studies performed in this field (20,21). According to the self-efficacy theory, applied with respect to addiction, one with low self-expectations could not resist motives to substance use. On the contrary, people with high self expectations are able to encounter high risk situations successfully. Bandura suggests that the expectations related to" personal efficacy" determine whether the oppositional behavior shall persist in encountering difficulties and disturbances (23).

In agreement with other studies athletic drug users possessed an external locus of control and more dysfunctional attitudes rather than controls. It seems that athletes using doping agents, unlike the others, not only didn't attribute the athletic achievements to their own personal abilities and efforts (i.e., internalization), but also related them to some external factors like doping agents and chance (24,25). In other words they cognitively believe in a lack of control over events and their consequences and they possess a lower capacity to influence the environment, and deny the prediction of such achievements in the future by considering the chemical substances to have a role. These people may believe that the only reason behind their good performance is chemical substances. The result of this will lead to not only the dependence of continuation of performance on continuous use of chemical substances, but also a negative effect on the athletes' views of themselves, and will lead them to conclude that the only main road toward their sport achievements is through doping agents (26).

It appears that the athletes using doping agents have a misunderstanding of sport achievements. They cognitively believe that the events and their consequences are out of their control and that they have a low-level capacity for influencing the environment. Such an attitude can often lead to a feeling of depression and helplessness, leaving the athlete more susceptible to mental disorders (11).

According to the cognitive view of Aaron Beck, negative attitudes toward oneself, environment and the future form the triad for recognizing the negative cognition in depressed patients (26). On the other hand, Battler et al considered having a sense of self-vulnerability, possessing a threatening view toward the environment, and viewing the future as something unpredictable all to be negative cognitive attributes of anxious people (26).

As mentioned before, dysfunctional attitudes were cognitively related to depression and anxiety and could cause the disease to develop. Therefore it is not too difficult to imagine how athletic drug users might face more psychiatric morbidities compared with the controls. To summarize, the present findings are in accordance with Beck's theoretical basis of cognitive therapy (27,28).

Previous findings showed that athletic stresses, lack of confidence in one's ability to

face stress, taking a view of low control over the environment, attributing consequences to external factors, and a belief in false ideas and inflexible rules pave the way for physical problems and psychological disorders (8,9,11,12,29,30).

As such, our study was suggestive that a combination of these cognitive factors can play an important role in adolescents' psychological imbalance and approaching to doping consequently. Therefore a holistic approach should be employed to find at risk adolescents and provide appropriate alternatives to drug use in sports. Moreover we proposed that a sport psychologist and a psychotherapist should be added to teacher, coach, parents, and sports medicine professionals, in a collaborative team to support adolescent athletes against risky behaviors.

References

1. Sadock BJ, Sadock VA. Synopsis of Psychiatry. Philadelphia: Lippincott Williams & Wilkins; 2007.
2. Silver MD. Use of ergogenic aids by athletes. J Am Acad Orthop Surg 2001; 9: 61-70.
3. Cogeni J, Miller S. Supplements and drugs used to enhance athletic performance. Pediatr Clin North Am 2002; 49: 435-61.
4. Bahrke MS, Yesalis CE. Abuse of anabolic androgenic steroids and related substances in sport and exercise. Curr Opin Pharmacol 2004; 4(6): 614-20.
5. Grunbaum JA, Kann L, Kinchen S, Ross J, Hawkins J, Lowry R, et al. Youth risk behavior surveillance: United States, 2003. MMWR Surveillance Summaries 2004; 53(SS02): 1-96.
6. Buckley WE, Yesalis CE, Friedl KE, Anderson WA, Streit AL, Wright JE. Estimated prevalence of anabolic steroid use among male high school seniors. JAMA 1988; 260(23): 3441-5.
7. Rickert VI, Pawlak-Morello C, Sheppard V, Jay MS. Human growth hormone: a new substance of abuse among adolescents? Clin Pediatr (Phila) 1992; 31(12): 723-6.
8. English G. A theoretical explanation of why athletes choose to Use steroids, and the role of the coach in influencing behavior. Nat Strength Cond Assoc J 1987; 9: 53-6.
9. Kelley BC, Gill DL. An examination of personal/situational variables,stress appraisal, and burnout in collegiate teacher-coaches. Res Q Exerc Sport 1993; 64(1):94-102.
10. Annenberg Public Policy Center of the University of Pennsylvania. Young Americans say alcohol, marijuana, cigarettes, and lottery tickets are easily accessible: Drinking, smoking, drug use and gambling are more associated with the popular kids than the unpopular ones. 2002. Available from: www.annenbergpublicpolicycenter.org/Downloads/Adolescent_Risk/Tobacco/risk_release.pdf
11. Seligman MEP. The Helplessness on depression. Development and death. Sanfrancisco: W.H. Freeman & Company; 1975.
12. Bandura A. Social Foundations of thought and action: A Social cognitive therapy. Engle wood Cliffs NJ: Prentice Hall; 1986.
13. Parvin LE. The personality psychology. Research and theory. Philadelphia: Lippincott Williams; 1993.
14. Ghafarinejad A, Poya F, Nakhai MR. [Assessment of psychological disorders in athletes using anabolic steroids.] Iranian Journal of Psychiatry and Clinical Psychology 2003; 8(4): 39-44. Persian.
15. Anastasi A. Psychological testing: Basic concepts and common misconceptions. In: Rogers AM, James Scheirer C, editors. Stanley Hall lecture series. Washington DC, US: American Psychological Association; 1985. Vol. 5. p. 87-120.
16. Rahmani F. [Compare treatment or non treatment depressed patients' dysfunctional attitudes, and normal peoples.] Tehran psychiatric Institutes. Mental Health Research Center; 1999. Persian.
17. Palahang H. [The epidemiological study of psychiatric disorders in Kashan.] Andisheh va Raftar 1996; 4: 19-27. Persian.
18. Goldberg DP. General Health Questionnaire (GHQ). In: Rush AJ, Pincus HA, First MB, Blacker D, Endicott J, Keith SJ et al editors. Hand book of Psychiatric Measures. Washington DC: American Psychiatric Association; 2000. p. 75-9.

19. Laure P, Lecerf T, Friser A, Binsinger C. Drugs, recreational drug use and attitudes towards doping of high school athletes. Int J Sports Med 2004; 25(2):133-8.
20. Tate AK, Petruzzello SJ, LOX CL. Examination of the relation between self-efficacy and effect at varying levels of aerobic exercise. Journal of Applied Social Psychology 1995; 25(21): 1922-36.
21. Treasure DC, Newbery DM. Relationship between self-efficacy, exercise intensity, and feeling states in a sedentary population during and following an acute bout of exercise. Journal of Sport and Exercise Psychology 1998; 20(1): 101-10.
22. Bandura A, Social cognitive theory of self-regulation. Organizational Behavior and Human Decision Processes 1991; 50: 248-87.
23. Bandura A. Self-efficacy: the exercise of control. New York: W H Freeman; 1997.
24. Rotter JB. Generalized expectancies for internal versus external control of reinforcement. Psychol Monogr 1966; 80(1): 1-28.
25. Dweck CS, Elliot EL. Achievement sources of distress among elite athletes. Longitudinal interactions between motivation. In: Hetherington M, Editor. Handbook of child psychology Socialization, personality and social Achievement goals in sport: motivation. New York: Wiley; 1983 Vol. 4. p. 643-91.
26. Blackburn I, Davidson K. Cognitive therapy for Depression and Anxiety. London: Blackwell scientific publication; 1990.
27. Beck AT. Cognitive therapy and the emotional disorders. New York: International Universities Press; 1976.
28. Beck AT, Rush AJ, Shaw BF, Emery G. Cognitive therapy of depression. New York: Guilford Press; 1979.
29. Kindlundh AM, Isacson DG, Berglund L, Nyberg F. Factors associated with adolescent use of doping agents: anabolic-androgenic steroids. Addiction 1999; 94(4): 543-53.
30. Veodey RS, Udry EM, Zimmerman V. Interpersonal and situational Predictors of coaching burnout. Journal Sport and Exercise Psychology 1992; 14: 40-58.