# Bigger, Stronger, and Better Looking:

# Performance Enhancing Drug Use by Adolescents

by

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A Research Paper
Submitted in Partial Fulfillment of the
Requirements for the
Master of Science Degree
in

School Counseling

Approved: 2 Semester Credits

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May, 2011

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**Title:** ***Bigger, Stronger, and Better Looking: Performance Enhancing Drug Use by Adolescents***

**Graduate Degree/ Major: MS School Counseling**

**Research Adviser:** **Carol Johnson, Ph.D.**

**Month/Year:** **May, 2011**

**Number of Pages:** **29**

**Style Manual Used:** **American Psychological Association, 6th edition**

## Abstract

There has been an ongoing issue with adolescents' use of performance enhancing drugs. These concerns are predominantly viewed in the realm of sports, with students striving to become better athletes. However, there has also been an increase in the general population of students using certain drugs to try to help transform their bodies into an idealized body image. Some of these performance enhancing drugs are illegal, have harmful side effects, and are potentially lethal to adolescent users.

There has been an increase in the use of performance enhancing drugs by adolescents especially an increase in the use of these drugs by adolescent females, both athletes and non-athletes. An examination of the Centers for Disease Control's (CDC) National Youth Risk Behavior Survey found that large percentages of females throughout all high school levels reported one or more occasions of steroid use.

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Acknowledgments

First and foremost, I would like to thank my advisor Dr. Carol Johnson. Her encouragement, patience, and leadership made completing this process possible. Her passion, positive attitude and zest illustrate what it is to be an amazing school counselor. She has inspired me throughout my graduate program. She has given me a wealth of knowledge that I will carry with me forever.

I would like to thank my closest friends: Nico, Ruby, Tre, Kujo, Drewbie, Nelson and Kip. Thank you for sticking by my side throughout my graduate program and specifically this paper, which have required so much of my time. Thank you for being a great outlet for relieving stress and for some much needed moments of relaxation.

Most importantly I would like to thank my family. Thank you for your endless patience and support. Thank you for always being in my corner. This process would not have been possible without you.

Lastly I would like to dedicate this paper to the memory of my father. Thank you for being my number one supporter, my biggest fan, and most importantly my best friend.

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## Chapter I: Introduction

Historically American athletes had an image of being "the best" meaning the strongest, fastest, most powerful, and most attractive. This is a sentiment that has carried over and tainted the perspective of many young athletes with a new pressure to compete under the influence of performance enhancing drugs. The worrisome drug problem is coming from adolescents misusing performance enhancing herbs, supplements and prescription drugs.

Performance enhancing drugs are simply defined as any drug that has the purpose of helping one gain an advantage over another person. The Mayo Clinic breaks down performance enhancing drugs into five different categories: anabolic-androgenic steroids (AAS, or steroids), diuretics, creatine, androstenedoine, and stimulants (2008). These five categories of drugs were originally created with specific medicinal implications in mind. Many of the drugs listed by the Mayo Clinic as performance enhancing drugs are still also common medical treatments. Drugs and supplements that would fit into the categories of diuretics and stimulants have become household names as they have become so commonly used that athletes forget that they can be extremely dangerous when misused.

Supplements including creatine have spread rapidly through gyms. Athletes, especially adolescents found creatine use as a quick way to gain muscle mass and strength. With few regulations, limited research, and without proper supervision, creatine can be tremendously detrimental to the users' health.

Performance enhancing drugs are most commonly taken to increase growth in lean-muscle mass. They also can aid in fat loss while increasing energy. These results are most effective when the user follows a physicians' regulated dose, and through cycling on and off of the drug; however, most users obtain their drugs from illegal sources including the internet or from illicit labs producing synthetic designer drugs. Because these drugs are not often produced

legally they are not held to the same quality control as other medically prescribed drugs. Additionally, since the doctors rarely prescribe, administer, or supervising the illicit drug use, most users find themselves using more than the suggested levels, and not cycling on and off of the drug as they should be.

Steroids, diuretics, and creatine are the most widely used supplements and of those three, steroids have now become most commonly used. With recent scandals regarding performance enhancing drugs, especially steroid misuse, doping has become a common topic for discussion. The use of performance enhancing drugs during athletic events can be traced back to the late 1800's when Arthur Linton, a 24 year-old cyclist, died during a race believed to be a result of taking a stimulant called trimethyl. Since then the world of sports has seen countless athletes using some performance enhancing drug in sports such as cycling, swimming, wrestling, baseball, and football. In recent years the United States has seen many cases of performance enhancing drug use and subsequent tragic outcomes (Sports Illustrated, 2008).

Since the early 1990's professional athletes have seen a devastating trend toward increased use of performance enhancing drugs. Due to this increase in illegal substance abuse, professional athletes and their families have endured great tragedy and loss. In 1992, NFL defensive end Lyle Alzado died from brain cancer which he blamed on two decades of steroid use. In 2003, an inside source leaked information about a distributor of performance enhancing drugs who worked with Olympic champion Marion Jones, who in 2007 was stripped of her five Olympic medals, and major league baseball players Barry Bonds, Jason Giambi, and Garry Sheffield.

Professional baseball player Jose Conseco wrote a tell-all book titled *Juiced: Wild Times,Rampant 'Roids, Smash Hits, and How Baseball Got Big, (*2005) where he divulged his own extensive steroid use while alleging steroid use by fellow players Mark McGwire and

Sammy Sosa. Tragically in 2007, professional wrestler Chris Benoit murdered his wife and seven-year-old son. Benoits' body was found to have ten times the normal amount of testosterone in his blood (Sports Illustrated, 2008). Performance enhancing drug use is not only found in the sports arena as a breaking story claimed that hip-hop stars Mary J. Blige, 50 Cent, and Wyclef Jean allegedly used or received shipments of prescribed steroids and human growth hormone (Sports Illustrated, 2008).

Consequently, from the expanded media coverage of performance enhancing drug use by international athletes, performers, and celebrities, now the adolescent athlete and non-athlete populations are exposed to opportunities for use. According to the Center for Disease Control (CDC, 2009), 3.3% of students from 9$^{th}$ through 12$^{th}$ grade nationwide had taken steroid shots or pills without a doctor's prescription. Due to the increase in performance enhancing drug use by adolescents, they have become one of the largest targeted markets for drug sales. Performance enhancing drug use has become extremely complicated because the drugs can be administered orally, injected intravenously, or through the use of transdermal patches. When using drugs through a variety of means, media has often used "doping" to indicate an athlete using supplements or misusing prescription drugs to enhance athletic performance. Because adolescents are a highly targeted market, use of the drugs is difficult to detect, thus leaving young athletes at great risk of abuse through doping (Melzer, Elbe & Brand, 2010).

How to prevent adolescents from using performance enhancing drugs has now become an area of heated debate and controversy. Prevention awareness now falls under the responsibility of caring adults and coaches in schools. Currently, within most schools' curriculum there are drug prevention and/or awareness programs that usually take place in health education classes, in athletic training programs, or through classroom guidance lessons taught by the school counselor. However, many of these programs do not always cover up-to-date information on

doping or performance enhancing drugs, and if classes do contain information about herbal supplements and performance enhancing drugs, teachers and counselors might not be well informed without additional training.

A current trend in many schools is to have randomized drug tests just for the athletes, whereas other school boards are considering testing for substance abuse for the entire school. Parents and others sometimes questions the legal premise of the testing and consider it an invasion of privacy or may worry about a false positive, indicating drug use when there wasn't any. Drug tests may be set up to find students who are using various drugs and supplements, to reduce the number of students who use out of fear of being caught and also as a preventative tool to deter use from even happening. New Jersey, for example, is one state that has been finding success in lowering the number of students testing positive to drug use due to the use of randomized drug tests in their schools (Brady, 2008).

**Statement of the Problem**

There has been an ongoing issue with adolescents' use of performance enhancing drugs. These concerns are predominantly viewed in the realm of sports, with students striving to become better athletes. However, there has also been an increase in the general population of students using certain drugs to try to help transform their bodies into an idealized body image. Some of these performance enhancing drugs are illegal, have harmful side effects, and are potentially lethal to adolescent users. The problem becomes, how can caring adults become more aware of signs of misuse of supplements and what can be done to help youth to recognize the harmful effect of these performance enhancing drugs?

## Purpose of the Study

The purpose of this literature review is to investigate the use of performance enhancing drugs by adolescents and to provide insight to educators to raise awareness to deter illicit use. Caring adults including parents, coaches and school counselors can work together to update training to better identify use of drugs and help all students realize the potential danger of doping during the early development years. The literature review will take place during the spring semester of 2011.

## Research Questions

This literature review will address the following questions:

1) What are performance enhancing drugs and how does doping impact teenagers?
2) What are the potential side effects of using performance enhancing drugs for adolescents?
3) What drugs are adolescents using to enhance performance or alter body image and why are they doing so?
4) What has been done previously, and what can be done to prevent further use of performance enhancing drugs by teens.

### Assumptions and Limitations

It is assumed that the information used comes from reliable and valid sources that contain up-to-date information. It is also assumed that the material is free from bias. This review is using only existing literature found during the spring of 2011, which may limit the use of any current on-going research currently being performed in the field of drug use by adolescents. Consequently, other pertinent information may have been missed. The study is further limited to illicit use of drugs to enhance athletic performance and body enhancing drug use for school-age students.

## Definition of Terms

For clarity and to ensure better understanding for the reader, the following terms are defined.

**Designer Steroid (drugs).** Synthetic steroids created by chemical modification to other anabolic steroids. These are created illegally with a purpose of avoiding detection and testing positive during drug tests.

**Doping.** The abuse of performance enhancing substances and methods, and all related actions (Melzer, Elbe & Brand, 2010).

**Performance enhancing drugs.** This term will be synonymous with anabolic-androgenic steroids (steroids), creatine, diuretics, androstenedione, and stimulants unless otherwise noted in-text.

**Steroid (AAS).** For the purpose of this paper the term steroid(s) will refer to Anabolic Androgenic Steroids (AAS) which are used to increase muscle mass. Within the term, the word Anabolic refers to promoting muscle building and Androgenic refers to male hormones which typically result in facial hair growth and developing a deeper voice.

**Supplement (Dietary Supplements).** products containing mixtures and variations of vitamins and minerals that are used to enhance athletic performance.

# Chapter II: Literature Review

## Introduction

This chapter provides a more in-depth examination of what performance enhancing drugs are, and the hazards of teen athletes using these drugs, followed by an explanation for why both adolescent males and females are doping. An exploration of what has already been done to try to combat the use of performance enhancing drugs is included and the chapter will conclude with a look at what efforts have been effective to prevent the use of performance enhancing drugs.

## Performance Enhancing Drugs

The world of performance enhancing drugs is becoming widely recognized as a serious problem starting with global sports such as the international competitions in the Olympics right down to small town high school student athletes. Even though there are serious health related potential issues, many people have little to no idea about what performance enhancing drugs are. The Mayo Clinic (2008) classifies performance enhancing drugs into five categories including anabolic-androgenic steroids, diuretics, creatine, androstenedione, and stimulants.

An anabolic-androgenic steroid (AAS) is a formal name for what is more commonly known as steroids. Breaking down this complex term simplifies what the steroid does by promoting muscle growth; whereas, androgenic effects are responsible for typical male traits such as facial hair (Mayo Clinic, 2008). So steroids in general promote muscle growth and facial hair in athletes by imitating the naturally occurring male sex hormone testosterone (Johnson, 1990, p. 1111). These synthetic steroids are often used for medical purposes; however, they are now being used outside the original intent of the medicine to help develop certain well-defined muscular body types and to increase athletic performance.

The reason steroids have become so popular in the adolescent population is because they generally result in increased muscle size, an increase in physical strength, and a decrease in

amount of muscle recovery time needed. While many young athletes are still in their teen years of early development, steroid use can help them have the appearance of someone more mature. Some commonly used synthetic steroids in use are methyl testosterone, oxandrolone, and oxymetholone (Mayo Clinic, 2008).

There is increasing demand for a newer, more dangerous class of steroids known as designer steroids. These drugs are frequently illegally created and distributed, and often sold online without prescriptions or medical supervision. These drugs are specifically designed for use by athletes because they are created to be undetectable by present day testing methods thus athletes are able to use them while competing. Because they are created illegally, they are not always properly tested, and do not have to meet the standards of the Food and Drug Administration (FDA) (Mayo Clinic, 2008).

Lack of consistent formulation, lack of doctor supervision, and variation in recommended amounts are always a concern for these types of performance enhancing drugs. At any supplement store or website one will find products that specifically state they are not tested by the FDA. Some commonly used designer steroids include: tetrahyrdogestrinone (THG), desoxymethyltestosterone (Madol), and norbolethone (Genabol) (Mayo Clinic, 2008).

None of the steroids, synthetic anabolic-androgenic or designer, are without risk. There are physical side-effects that may be experienced while using steroids. Men may experience the growth of prominent breasts, loss of hair, infertility, and shrunken testicles. Women taking steroids may develop a deeper voice, enlarged clitoris, increased body hair, and baldness. Both men and women may experience severe acne, liver problems, tumors, increased "bad" cholesterol and decreased "good" cholesterol, increased aggression, and depression which may lead to suicidal thoughts and/or attempts and possible infectious diseases like HIV if injecting the drugs, and future health issues (Mayo Clinic, 2008). These are serious potential consequences

that many students aren't aware of that may show up later in life based on poor decisions made as a student athlete. Parents and coaches need to keep informed about the potential side effects and question if the outcome is worth the risk.

The demand for supplements is growing as fast or possibly faster than that of steroids. Supplements are often used in conjunction with steroids. Supplements are also used by athletes of all ages. Because supplements are sold over-the-counter, many people believe them to be harmless. However, since supplements are considered *food* and not drug, the FDA manufacturers are not required to uphold the same safety standards as drug producers. This allows supplements to be diluted or mixed with other substances that might be harmful and/or illegal. An example of this mix would be the popular yet controversial energy drinks loaded with caffeine.

Creatine has become one of the newest substances that is being used by many people. Creatine is "a naturally occurring compound produced by your body that helps your muscles release energy" (Mayo Clinic, 2008, Creatine section, para. 2). Creatine helps produce bursts of power and also delays muscle fatigue. Because of this gain in short bursts of power, creatine has become popular with swimmers, jumpers, and weight lifters (Fernandez & Hosey, 2009).

There are some possible minimal side effects of creatine use such as stomach and muscle cramps, nausea, diarrhea, and weight gain. The weight gain is a result of muscle retaining more water rather than muscle growth. With high-dose usage there are higher risks of potential damage to kidneys and liver, which naturally produces creatine. Long term studies on side effects of creatine are still needed (Mayo Clinic, 2008). Because of the side effects and lack of research, creatine is not recommended for people under the age of 18. However, Fernandez and Hosey (2009) wrote that creatine is used by approximately 5.6% of high school athletes, with

44% of those users being 11th and 12th grade students. Because of this high level of use there is a demand for further research on the effects of creatine on adolescents.

Androstenedione is another prominent performance enhancing drug that has gained popularity. Originally made as an anti-aging drug, androstenedione is produced in the adrenal glands and gonads. In 2004, the FDA banned this substance "because of its potent anabolic and androgenic effects" (Fernandez & Hosey, 2009, p. 18). Androstenedione (andromax) use results in muscle building, increased strength, and fat reduction which are similar to AAS. Likewise, androstenedione's side effects are very similar to that of AAS including acne and reproduction issues (Fernandez & Hosey, 2009). Because many drugs are tested on adults, it isn't known what impact it may have on current teen athletes.

Stimulants offer one of the broadest categories of performance enhancing drugs. Stimulants include common everyday substances like coffee or cold medicine, and also include street drugs like cocaine and methamphetamine. Stimulants have become popularized as performance enhancing drugs because of their ability to reduce fatigue, suppress appetites, and increase alertness and aggression (Mayo Clinic, 2008). Ephedrine is a stimulant that has become popular among athletes, most notably hockey players. Users of ephedrine find that the drug makes them "feel less fatigued, experience bursts of energy, and lose weight" (Fernandez, Hosey, 2009, p. 20).

Although there are reported benefits to physical performance, ephedrine has side effects like insomnia, nervousness, and irritability that might also decrease athletic performance. Other major side effects from ephedrine use can result in heart palpitations and rhythm abnormalities, tremors, mild hypertension, and convulsions. Student athletes who are already pushing their bodies to maximum performance maybe putting their hearts and circulatory systems in jeopardy

due to the lack of research of the substance on teenagers. Because of the many cardiovascular risks ephedrine has become a banned substance by the FDA (Mayo Clinic, 2008).

Human Growth Hormone (HGH) is a drug rising in popularity. Fernandez and Hosey (2009) wrote that human growth hormone has become popular because it is a pituitary hormone which results in anabolic muscle growth without the androgenic side effects seen in AAS steroid use. Medically HGH was originally used as a treatment for dwarfism because it increases "insulin-like growth factors… and leads to increased protein synthesis and muscle mass" (Fernandez & Hosey, 2009, p. 20).

Martin, Baron, and Gold (2006) found that HGH is currently marketed on the internet in varying form such as pills, drops, and aerosol, yet these forms of medications are usually ineffective. Routinely HGH is administered only through injection, which in the recreational arena poses risk of infection, hepatitis, and HIV due to the use of shared needles (Martin, Baron & Gold, 2006).

HGH comes with other major side effects which may include hypertension, abnormal bone growth, cardiovascular disease, glucose intolerance, some cancers, and a decreased life span (Martin, et al., 2006). Because of the severe and potential life threatening side effects, HGH has become a banned substance in the area of competitive sports also.

**Why Adolescents Are Doping**

With the increase in use of performance enhancing drugs by professional athletes and celebrities there has also been a notable rise in use of the same drugs by adolescents. In 2009, the Centers for Disease Control's Youth Risk Behavior Survey found that 3.3% of high school students indicated that they had taken steroids one or more times without a doctor's supervision (Centers for Disease Control, 2010). This has been a fluctuating statistic that has reported a continuing increase in usage in students since 2003 (CDC, 2010).

With the continuing increase in use of performance enhancing drugs, male adolescent athletes have become the most typical group noted for experimenting with and continuously using performance enhancing drugs. The CDC found that statistically males have had a higher percentage of reported use than females. Drewnowski, Kruth, and Krahn (1995) found in their cross-gender survey that males have indicated a desire to gain weight rather than lose weight. This desire to gain weight is indicated by gaining body mass coming from an increase in muscle mass and size. Drenowski's (1995) found that males reported that gaining muscle mass and size came from rigorous physical exercise.

In many cases adolescent males may struggle with gaining muscle mass, and this is where performance enhancing drugs, specifically steroids, would aid the struggling adolescent. With the gain in muscle size and strength it is easy to see that steroids would have an impressionable impact on adolescent athletes who wants to perform at a higher level in hopes of participating in collegiate and professional level sports. Most individuals would tend to think that football, baseball, and wrestling would be the obvious place to look for athletes using steroids; however, endurance sports such as track, distance running, and swimming have been areas where there has been a larger increase in steroid usage.

As previously mentioned, these adolescent athletes who choose to use steroids are at risk of potential life threatening side-effects. Along with the side-effects mentioned previously, Lumina and McGinnis (2010) report that "exposure to high levels of androgens [AAS, steroids] during adolescence may alter brain reorganization that is necessary for the acquisition and expression of adaptive adult patterns of behavior" which may be "long-lasting, if not permanent" (p.199).

Godo, Graves, O'Kroy, and Hecht's (2006) study indicated that steroids use might be somewhat less worrisome when looking at the numbers of adolescents using supplements to gain

an edge over competitors. Godo (2006) writes, "Among all participating athletes, 21.7% believed that taking dietary supplements was a safe way to improve sports performance" (p. 96). Within the same data, males were far more likely to use supplements to increase their athletic performance. One possible reason for the increased use by adolescent males is that they receive greater social support to exercise excessively and there are more social norms expectations for male exercise behavior. Many young athletes strive for a totally "ripped" body, meaning good muscle definition and weight bearing capacity. However, normal the expectation to exercise and sculpt muscle mass may seem, the excessive use of supplements can be extremely dangerous.

There are only certain subgroups of people that actually need or require the aid of supplements, few of which contain adolescents (Godo, Graves, O'Kroy & Hecht, 2006). As stated previously the use of performance enhancing drugs was typically viewed as an issue for males and stereotypically male athletes; however, three different national surveys taken during the 1990's documented a major increase in the use of these drugs by younger female adolescents, and then a diminishing use as the girls got older (Elliot, Cheong, Moe & Goldberg, 2007).

There had been an increase in steroid use by adult females who participated in professional athletics or bodybuilding, but not in the general population of typical high school athletic female adolescents. The increase in use by younger adolescent females has only recently increased, as Elliot et al. examined the 2003 Centers for Disease Control's Youth Risk Behavior Survey and found that 7% of 9$^{th}$ grade girls indicated having current or prior steroid use. This data showed that reported steroid use declined as students progressed through school. In 2003, 40.7% of girls reporting steroid use were in the 9$^{th}$ grade, 26% reported use in the 10$^{th}$ grade, and there was a significant drop to 13.6% of reported users who were in the 12$^{th}$ grade.

This trend was consistent with more current data from the Center for Disease Control. In the same 2009 Youth Risk Behavior Survey, there was an dramatic decrease in the number of

girls reporting steroid use. Ninth and tenth grade use was decreased 2.3% and twelveth grade use was 1.6% (CDC, 2009). This is an encouraging trend to see as the girls seem to be getting the message that doping is not good; however, this decrease is believed to be partially credited to adolescents, both male and female, not believing what they were taking to be steroids or other performance enhancing drugs.

Elliot and his team also examined the Center for Disease Control's Youth Risk Behavior Survey 2003 data set to see if, like males, there was an increase in steroid use by female athletes compared to non-athletes. In general, performance enhancing drugs are viewed as something only used by athletes, this commonly held notion was also true for females. However, Elliot found the contrary to be true. Elliot's 2003 data showed that out of the reported female steroid users, only 37.8% reported participation in some team sport. The authors contributed this finding to two possibilities: first, team sports participation can act like a deterrent to using steroids; secondly, body image was a much larger deciding factor for use of performance enhancing drug use (Elliot, et al. 2007).

Elliot et al. (2007) brought forth the notion of a possible pattern of co-morbidity between female steroid use and other risky health behaviors. Elliot and his researchers investigated how reported steroid use related to how female adolescents reported: alcohol and other drug use, sexual behaviors, other health-related behaviors, weight loss behaviors, and overall mental health. All of these categories were affected negatively when combined with steroid use. The use of drugs and alcohol by steroid users was double compared to non-steroid users. A trend that was nearly the same in all other previously mentioned categories.

Elliot and his researchers also found that within the 2003 Youth Risk Behavior Survey from there were high percentages of females, steroid users and non-users, reporting that they have attempted weight loss. Means of attempting to lose weight were broken into four categories

of exercised; not eaten for 24 hours or more; using diet pills, powders, or liquids; and vomited or took laxatives. The number of females who used exercise was very similar between steroid users and non-users; however, in the remaining categories, steroid users doubled that of nonusers, with the greatest spread occurring in vomiting and taking laxatives (6.7% of nonusers and 26% of users).

The survey's mental health category also held alarming results. For this category participants were asked about feeling sad or hopeless every day for two weeks or more in a row for which 34.4% of steroid non-users reported feeling that way and an alarming 67.9% of steroid users also reported feeling sad or hopeless. Furthermore, the study asked about suicidal thoughts and actual suicide attempts. Over 43% of participants who were reported steroid users indicated they had planned for suicide and the same percentage had attempted suicide. This alarming statistic was more than three times that of steroid nonusers (Elliot et al., 2007).

**Body Altering Drug Use**

Student athletes make up only a small portion of all adolescent males who are using steroids and other performance enhancing drugs. There is, however, a growing population of adolescent males who are not seeking gains in athletic performance but are dissatisfied with their general body shape or appearance. For years there has been an awareness of body image disorders in women which have often lead to diagnosis including bulimia and anorexia nervosa.

But now there is "a growing trend toward male body obsessions" (Stout & Frame, 2004, A Universal Problem section, para. 2). Drewnowski et al. (1995) wrote that "almost 70% of college age men were dissatisfied with their bodies" (p.382). In their study of 2,088 high school graduates aged 18, Drewnowski et al. (1995) found that 21% of their male sample described themselves as underweight, and 40% wished to weigh more than their current weight (p. 382).

So the perception that only females are concerned about body image is being challenged by current data on male perceptions of body image too.

Diuretic is a type of drug classification that is better known and used by the population in general. Using diuretics alters individuals' natural level of fluids in their bodies. Diuretics are typically used as a means of losing weight by eliminating water weight. They are also used as an aid in passing some types of drug tests by diluting urine. Students who use drugs may try to drink excessive amounts of fluids to clean the drugs out of their systems, and then use diuretics to remove the fluids from their bodies.

One of the most commonly known diuretics is Lasix (Furosemide). This drug causes the kidneys to get rid of unneeded water and salt from the body. It is becoming more common for young women to use diuretics to lose weight before a special occasion like prom, a big date or spring break. Men use diuretics to help maintain weight loss for wrestling season. Some adverse effect of taking diuretics while not under the supervision of a medical doctor may include dehydration, muscle cramps, exhaustion, dizziness, potassium deficiency, heart problems, sudden drop in blood pressure, and possibly death (Mayo Clinic, 2008).

Adolescent males, much like adult males, have noticed the societal trend for males to have a more muscular build, and to avoid being either too fat or too thin. Realizing that most adolescent males do not fit the ideal muscular category they may begin to strive to achieve that desired physique. Due to maturity, genetics or general health, many adolescents find this new physique may become an impossible goal on their own, so they turn to the help of steroids and other performance enhancing drugs (Stout & Frame, 2004). This makes adolescent males a population at risk for potential health related issues.

Clearly both male and female adolescence are using performance enhancing drugs to gain an advantage in the world of athletics and alter body development. Male football players have

reporting wanting to increase weight and size in hope of becoming a better football player (Drewnowski et al. 1995). However, Drewnowski et al. (1995) also found that large amounts of performance enhancing drug use by athletes involved in endurance sports such as swimming and running. Drug use by student athletes is of great concern; however, undetected use by non-athletes can be even more alarming.

Male and female non-athletes have also become a group of serious concern as they are beginning to use doping to alter body image too. Recently there has been growing awareness of adolescent females suffering from conditions related to trying to obtain an idealized body image. Even more concerning, the same issues have been emerging in adolescent males. Female adolescents have been seeking a sleeker body shape which recently has evolved into a still slender but more toned body shape as a result of fitness trends. Similarly male adolescents have been following the same fitness trends that encouraging young men to be slim and muscular to fit into society also. (Stout & Frame, 2004)

These seemingly impossible body standards are direct results of media images and peer pressure. Current television programs, commercials, and magazines depict women who are toned and slender indicating that they are healthier and more attractive than other heavier normal weight women. Equally, masculinity has been recently portrayed by muscles and well defined physiques which communicate having power and control over other men who do not fit into that category (Stout & Frame, 2004). Similarly, there has been a change in body shape in the world of toys. The G.I. Joe figurine has changed its body over the years to where it is now an unrealistic portrayal of what a male figure should resemble (Stout & Frame, 2004). In the same fashion, the beloved Barbie doll has morphed into a form that is an unattainable and unrealistic body image for females also.

Peer pressure was also attributed to student supplement and performance enhancing drug use by Stout and Frame (2004) and also by Elliot and his team (2007). Adolescents are quick to realize the shortcomings in their bodies, and are even quicker to point out the deficiencies in others. Stout and Frame (2004) both reported that adolescent males who do not fit into the ideal body image place a silent pressure on themselves and others. One participant reported "if you've got friends who are quite big in build, you want to be the same as them… it's on your conscience all the time. You want to be that sort of size" (Peer Pressure section, para. 1).

**Prevention Strategies**

With the use of performance enhancing drugs growing at such a rapid pace, there is a need to find ways to educate adolescents and their parents to prevent the misuse of these supplements and drugs. When dealing with adolescents, school educators, counselors and coaches may be viewed as one possible option needing to be on the forefront of information and prevention of drug use. There are also efforts that parents need to do to prevent the use of performance enhancing drugs.

Out of all the performance enhancing drugs previously mentioned, AAS steroids are the most strictly controlled by the government, because AAS steroids are used for medicinal purposes, they are regulated by the government. Currently AAS steroids are considered illegal to possess without having a prescription from a medical doctor. However, the supplement industry is not regulated by the government. The massively popular supplement creatine is legally sold as a dietary supplement in many different forms and can be purchased by anyone at any age (Fernandez & Hosey, 2009).

Organizations such as the National Collegiate Athletic Association (NCAA) have created banned substance lists in effort to reduce and prevent the use of performance enhancing drugs by student athletes. It is hoped that by clarifying supplements and drugs that the students will have

clear cut guidelines and expectations regarding the use of supplements. The Wisconsin Interscholastic Athletic Association (WIAA) has created performance enhancing and banned substance guidelines for athletes in the state of Wisconsin, clearly emphasizing state's standpoint of being "against the use of anabolic-androgenic steroids and other performance enhancing drugs" (WIAA, n.d., Front Cover, para. 1). The guidelines state that student athletes are required to follow the conduct codes and not to use any performance enhancing drug twelve months out of the year, not just during their athletic season. Banned substances including AAS steroids, ephedrine, diuretics, and androstenedione are prohibited from use by student-athletes.

There is also a list of substances that are not banned, but are severely discouraged including caffeine and creatine. Lastly, the WIAA identifies permissible supplements along with a list of warning signs identifying when a student might be using steroids (WIAA, n.d.). Similarly to WIAA's stand against performance enhancing drugs, The NCAA publishes a booklet on its drug-testing program that is more in-depth and thorough than the WIAA high school version. The NCAA includes "banned substances, medical exceptions, alcohol, tobacco, and other drug-education guidelines, drug-testing programs and protocol including a nine step procedure, drug-testing legislation bylaws, and institutional drug testing" (NCAA, 2010, p. 1).

Because of the increase in student drug use, including performance enhancing drugs there has been a more frequent trend of random student drug testing across the nation. There are now more than 1,000 school districts nationwide that use student random drug testing as part of their comprehensive efforts to tackle drug and alcohol use by teenagers (Brady, 2008).

Brady (2008) described a New Jersey school that implemented a random drug testing policy. Initially coming under heavy scrutiny, the program has seen success as a deterrent for student drug use. The school places all students, no matter their affiliation in athletics or extracurricular activities, into a pool and throughout the year they tested 20% of all students

(Brady, 2008). This method allows for the most equal opportunity to be tested. Programs like this have become common in schools, especially in the states of New Jersey, Florida, and Texas where drug testing student athletes has been required. Both federal and state governments have been allocating money specifically to cover the costs of drug testing in schools. "The U.S. Department of Education has awarded over 11 million dollars to 400 schools since 2003 to fund random drug testing programs..." (Brady, 2008, Additional Resources section, para. 6). This allocated money is somewhat controversial since a single drug test can cost a school over $100, so schools with large student bodies could be spending a substantial amount of their budget on drug testing (Brady, 2008).

Schools are once again faced with the challenge of dealing with adolescent misuse of supplements and performance enhancing drugs. Random drug testing is one form of prevention; however, schools also need to provide education and raise awareness about different drugs. The school counselor can play a crucial role in helping with drug awareness and prevention.

Counselors need to make sure that performance enhancing drugs are added to a school's current drug awareness curriculum. Stout (2004) wrote that counselors are in a distinct position to be able to help identify students who may be currently using or have used drugs. Counselors can provide an initial level of individual counseling for adolescents using performance enhancing drugs. Counselors have various techniques and training that could aid in trying to initially contact students who may be using performance enhancing drugs due to body image and self-esteem. A school counselor may help through early detection of students who may benefit from outside referrals. Counselors can also play a crucial role just by staying in communication and educating teachers, parents, and coaches (Stout, 2004).

## Chapter III: Summary, Critical Analysis, and Recommendations

This chapter summarizes findings from the literature and also provides a discussion of information about supplement use and performance enhancing drugs. This chapter will conclude with recommendations for future research.

### Summary

It is clear to see that there is a wide range of drugs and supplements that are considered to be performance enhancing drugs. The Mayo Clinic (2008) listed five major drug categories as performance enhancing drugs. Of these categories, anabolic androgenic steroids (AAS) has become one of the most widely known and debated drugs. All of the drugs listed carry with them high risks of harming the user with potential cancers, organ failure, hypertension, various cardiac disorders, and death.

Fernandez and Hosey (2009) further contributed information about the increasing use and risks of the performance enhancing drug human growth hormone (HGH). HGH has seen a rapid rise in use because of it has the anabolic muscle building outcomes of AAS, but without the androgenic side effects. Because of its natural occurrence in the human body and it being a relatively new drug, HGH has been extremely hard to detect without it being used along with other steroids. However HGH's popularity, Martin, Baron, and Gold (2006) found that HGH carries many of the same dangerous side effects to its users.

There has been an increase in the use of performance enhancing drugs by adolescents. What is amazing to many individuals is the sizeable increase in the use of these drugs by adolescent females, both athletes and non-athletes. An examination of the Centers for Disease Control's (CDC) National Youth Risk Behavior Survey found that large percentages of females throughout all high school levels reported one or more occasions of steroid use.

In 2009, the Centers for Disease Control conducted the same survey and found a major decrease in the reported use of steroids; however, this was believed to come from adolescents confusing what is a body altering drug and what they were thought they were taking to be steroids (Elliot et al., 2007). A more serious concern with female adolescents using steroids was found to be the rates of co-morbidity with alcohol and other drug use, early sexual behaviors, weight loss issues, and issues with mental health. An alarmingly high comparison was found with female adolescent steroid users and exceptionally high rates of suicidal thoughts and legitimate suicide attempts (Elliot et al., 2007).

**Discussion**

While attempting to raise awareness and to prevent adolescent performance enhancing drug use, schools have taken various steps to help their students. The most aggressive approach has been the increase in random drug tests in schools. New Jersey, Florida, and Texas are three states that have initialized federally funded randomized drug tests (Brady, 2008). Brady (2008) wrote that in New Jersey these randomized drug tests are a possibility for the entire student body, not just student athletes or those suspected of drug use. With budget cuts and schools struggling financially, it is a possibility that schools may have to cut back on the opportunity to use drug testing as a deterrent to student use.

Stout and Frame (2004) found that there are many aspects of a school counselors' job that can be effective tools in helping prevent adolescents using performance enhancing drugs. Similarly, a school counselor can provide initial counseling, group counseling, and referrals for on-going private counseling for students currently struggling from using performance enhancing drugs (Stout & Frame, 2004). School counselors, educators and coaches are all very busy and often lack the training necessary to teach students about all the types of body enhancing drugs available yet something needs to be done to keep young adults safe from the advertising and peer

pressure to experiment with these types of drugs. Because designer drugs are becoming more common, students may not even know what they are using. It is up to parents to monitor what students are ordering online and using to enhance athletic performance at home and discourage use of anything that gives them an unfair advantage over others.

**Recommendations for Further Research**

The Centers for Disease Control conducts an annual risk behavior survey for adolescents. This survey initially shed light on the issue of adolescents using steroids. However, in subsequent years, the survey has found to be dramatic decreases in the numbers of adolescents reporting steroid use. However there are no exact reasons as to why there is a decrease. Many have speculated that the reason for the decrease is because adolescents do not believe the drugs they are using are considered steroids (Elliot et al., 2007) or actual confusion regarding what is mixed into the drug. Other community leaders think it is because of random drug tests and still others think students are getting the message that using the performance enhancing drugs is not right, may cause potential harm, and violate the code of athletic ethics.

It is possible that there has been a decrease due to prevention methods or that the use of steroids is a trend that is phasing out. There needs to be further research to try to determine if the decrease in reported steroid use is accurate and if so, what the causes of this diminish are. Likewise, there is a need for further research on the success and failure rates of random drug testing in schools. This can be an effective means of prevention if consistently used; however, if there is any discrepancy in testing procedures, then there can be risk of the testing losing its effectiveness. The bottom line is we may not know for sure what using steroids, supplements, energy drinks and mixtures of these combinations will have on the future of the young adults using them. More research may contribute to the body of knowledge to help keep future generations of students safe, fit and healthy. It is an investment worth looking into.

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