

January 2021

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Recommended Citation

Moore, Matt and Abbe, Allison (2021) "The National Association of Intercollegiate Athletics Substance Use and Abuse Survey," *Journal of Issues in Intercollegiate Athletics*: Vol. 14: Iss. 1, Article 34.
Available at: <https://scholarcommons.sc.edu/jiia/vol14/iss1/34>

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The National Association of Intercollegiate Athletics

Substance Use and Abuse Survey

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This study conducted the first-ever investigation into the substance use and abuse behaviors of student-athletes representing the National Association of Intercollegiate Athletics (NAIA). The NAIA did not previously have data available on the alcohol, drug, and tobacco use among their 65,000+ student-athletes competing across approximately 250 member schools. As evident in the work of the NCAA (2017), the NAIA understood there were potential alcohol, drug, and tobacco use and abuse challenges impacting the biopsychosocial development of their athletes. These are challenges that could impact an athlete in a number of ways, some far-reaching one's time at a university. The current study used the NCAA Student-Athlete Substance Use Survey with a sample of NAIA student-athletes ($n = 2,489$). Results compared findings between the NAIA, NCAA, and overall college student population. This study allowed NAIA members as well as the national office staff to gain a clearer picture of student-athlete needs and next steps for promoting necessary, holistic athlete health and safety measures. Additionally, these results provide comparisons between NAIA student-athletes, NCAA student-athletes, and the larger non-athlete college population.

Keywords: substance use, student-athlete, college sport, alcohol use, tobacco use

The college experience is one that is often characterized as a passport to newfound freedom, self-discovery, professional networking, as well as a host of opportunities to expand one's social and academic prowess. While college engagement can present many positive opportunities for students, negative environmental factors and norms come into play on college campuses that might be a detriment to an otherwise thriving experience. College students, including student-athletes are susceptible to the "college effect", in which young, impressionable persons are exposed to high-risk behaviors (Brown et al., 2014; Welsh et al., 2019). Before students step onto campus, they may have already bought into the myth that the true college experience is established through heavy alcohol consumption and drug use. A replication of this high-risk behavior could result in an increase in negative impact on academic success, increased risk of sexual assault and other interpersonal violence, health-related consequences, and other negative outcomes (Schulenberg et al., 2017). While these high-risk behaviors exist across many in the college student population, this paper focuses on a comparative analysis between college students and college student-athletes. The authors place a specific emphasis on student-athletes competing for colleges and universities affiliated with the NAIA. There has never been a large scale study done on substance use and abuse in the NAIA student-athlete population. Researchers compared the findings of this study to rates of substance use and abuse of NCAA student-athletes and general substance use patterns among the overall college student population.

Substance Use Among College Students

Historical data has measured college students' substance use and abuse patterns. Much of this historical data comes from the Monitoring the Future (MTF) study supported by the National Institute on Drug Abuse and the National Institutes of Health (Schulenberg et al., 2017). This study has several purposes: (1) serving as an epidemiological indicator for characterizing current trends in substance use and abuse, (2) developing knowledge that increases understanding of how and why historical changes in substance use and abuse are taking place, (3) helping to discover risk and protective factors for, and consequences of, substance use and abuse, (4) informing policymakers on current trends, and (5) providing evidence for exploration of intervention solutions.

The MTF study indicates college students' substance use is a growing issue that carries devastating consequences to students' health and wellness (Schulenberg et al., 2017). Negative outcomes such as lower GPAs, significantly less time spent in-class, higher dropout rates, and postgraduate unemployment are common outcomes of substance use (Arria et al., 2015; Arria et al., 2013; Rimsza & Moses, 2005; Wolaver, 2002). In addition, college students' mental and physical health is at risk with soaring rates of general medical and psychiatric morbidity and mortality (Skidmore et al., 2016; White et al., 2011).

Alcohol Use

According to the 2018 National Survey on Drug Use and Health (Center for Behavioral Health Statistics and Quality, CBHSQ, 2018), the prevalence of college students consuming alcohol in the last month is 54.9%. The MTF study found 79% of college students consumed alcohol in the last year. Furthermore, 36.9% of college students reported binge drinking and 10%

of college students reported heavy alcohol use in the past month (CBHSQ, 2018; The Substance Abuse and Mental Health Services Administration, SAMHSA, 2017; Welsh et al., 2019). Binge drinking can lead to an increased risk of illicit drug use (O'Grady et al., 2008; Schulenberg et al., 2017; SIUC/Core Institute, 2013).

Illicit Drug Use

The MTF study found the percentage of illicit drug use among college students was 43% (Schulenberg et al., 2017). Marijuana use among college students was 39%. Amphetamine use among college students was 9.8%, cocaine use was 4.0%, ecstasy/molly use rates were 4.7%, heroin use was 0.2%, and LSD use among college students was 3.1% (Schulenberg et al., 2017). Prescription stimulants for cognitive enhancement have grown over the past ten years on college campuses (Welsh et al., 2019). For example, Adderall use without medical supervision was found to be 9.9% (Schulenberg et al., 2017).

Tobacco Use

While other forms of substance use on college campuses have increased over the past years, tobacco use has steadily declined (Welsh et al., 2019). However, electronic cigarette and “vaping” devices are currently trending among college-aged persons (Ickes et al., 2019; Schulenberg et al., 2017; SIUC/Core Institute, 2013). The MTF study found e-cigarettes have a higher 30-day prevalence than all other tobacco products at 18.2% for 18-year-olds and 27.7% for those 19 to 22 in age (Schulenburg et al., 2017). Current users chose electronic cigarette and vaping devices over other means of nicotine consumption for (1) ease of use (2) low perceived risk and (3) lack of odor (Ickes et al., 2019; Schulenburg et al., 2017). The MTF study found students identifying as men vaped nicotine twice as much as college women (19% vs. 9.4%, Schulenburg et al., 2017).

Substance Use among Collegiate Student-Athletes

Current studies found similar substance use trends within the student-athlete population in comparison to the overall non-athlete college population (NCAA, 2017; Schulenberg et al., 2017; SIUC/Core Institute, 2013). The primary source of data available on student-athlete substance use and abuse is from the NCAA Student-Athlete Substance Use Survey. The NCAA (2017) began using this quadrennial survey in 1985 to assess the health and well-being trends among student-athletes. 23,000 NCAA student-athletes completed the 2017 survey. Approximately 60% of NCAA colleges had at least one athletic team participate in the study. Study findings inform NCAA policymakers about current and historical information related to student-athlete substance use and abuse. The study also explores possible risk and protective factors that influence an athlete's attitude towards drug use and drug testing. The NCAA (2017) compares their findings to those of the non-athlete population, specifically with data from the MTF survey (Schulenberg et al., 2017). Results of the NCAA survey have led to several additional research studies, the development of educational resources, and policy modifications for this population of student-athletes.

Factors of Use

The rate of substance use and abuse among collegiate student-athletes is tied to a variety of factors. Studies indicate athletes often drink as a way to socialize and impress others (Wahesh et al., 2013; Williams et al., 2008; Zamboanga et al., 2008). Social cohesion is a desired trait among most collegiate athletic teams and an important aspect to team dynamics. If athletic teams create an overall culture in which substance abuse is frequent, as well as necessary for social inclusion, athletes will be more likely to engage in substance abuse than other athletes and students generally (Wahesh et al., 2013). Some sport teams may not have cultures that welcome weekend parties where alcohol and drugs are present. Therefore, one key factor within substance abuse is the team culture, social dynamics, and the team's perceived norms that come along with membership on a particular team (Coakley, 2016).

Athletes also use alcohol as a sport-related coping mechanism (e.g., to overcome athletic pressure) or as a sport-related positive reinforcement mechanism (e.g., as a tool to enhance athletic performance) (Martens et al., 2011; Wahesh et al., 2013). Other reasons for alcohol consumption among athletes include the use of alcohol as a tool to overcome academic stress (Ford, 2007), and to fit in with the overall campus population's norms (Williams et al., 2008).

Some additional indicators of increasing the likelihood of alcohol abuse include: (a) athletes participating in a team sport (e.g., football and lacrosse) versus an individual sport (e.g., golf and tennis) have been shown to be more likely to engage in high risk alcohol consumption as well as illicit substance use (Brenner & Swanik, 2007; Ford, 2007; NCAA, 2017; Moore, 2017) and (b) there are reported differences in substance use when an athlete is out of season versus in season (Weaver et al., 2013; Yusko et al., 2008). Substance consumption (alcohol, tobacco, and illicit drug) increases when athletes are out of season (Weaver et al., 2013; Yusko et al., 2008). While gender does not appear to be a significant predictor in alcohol use amongst student athletes, it has shown to be a predictor within illicit substance use as athletes identifying as men report to use illicit substances more often than women athletes (Buckman et al., 2011; NCAA, 2017).

Student-athletes use illicit substances for a variety of reasons. Green (2001) and Piacentino and colleagues (2017) found collegiate athletes used illicit substances to (1) improve athletic performance, (2) treat sport-related injuries, (3) social and personal gains, (4) improve energy levels, (5) suppress appetite in order to lose weight and enhance satisfaction with their body image, (6) manage stress, and (7) cope with general stressors.

Problem Outcomes

Collegiate athletes are not immune to the problem outcomes many face while engaging in consuming various substances. Though athletes share similar negative effects of alcohol, illicit drug, and tobacco use, special considerations and unique consequences can be drawn from those who participate in college athletics (Ford, 2008). Previous research found college athletes were more likely than non-athletes to engage in risky acts such as driving under the influence and riding with someone who was under the influence of alcohol or other substances (Nattiv & Puffer, 1991; Nattiv et al., 1997). College athletes were found to be three times more likely to gamble when intoxicated than their non-athlete peers (Weiss, 2010). Athletes were also more likely to exhibit risky sexual behaviors (e.g., sex with multiple partners) when intoxicated (Grossbard et al., 2007).

Substance abuse among college athletes can lead to negative effects on their ability to perform and can also carry consequences related to athletic eligibility. College athletes with heavy drinking patterns were found to be more likely to experience unintentional alcohol-related injuries and commit actions that could impact their sport performance, scholarships, playing time, and eligibility (Wahesh et al., 2013). Alcohol abuse can cause dehydration and damage to an athlete's central nervous system that can ultimately inhibit athletic performance (Dziedzicki et al., 2013). Recent research suggests substance abuse as a potential cause to insufficient sleep and insomnia among student-athletes (Bastien et al., 2019). Male student-athletes are significantly more likely to abuse performance enhancing drugs (PEDs, substances used to improve performance in sport) than non-athletes (Yusko et al., 2008). Deligiannis and colleagues (2006) found devastating cardiovascular side effects (e.g., myocardial infarction) among athletes who abused doping substances. Stimulants have also been found to be physically dangerous for athletes, as they are constantly pushing the physical capacity of their bodies. Due to hazy constraints upon stimulant substance use in most institutions, athletes are able to consume stimulants with or without a prescription with little to no threat to their eligibility (Reardon & Factor, 2016). The percentage of student-athletes prescribed narcotics for pain medication is much higher than the general student population due to athletic injuries and pain attributed to competitive athletics (NCAA, 2017). This warrants a special level of concern for athletes given the potential for addiction among narcotics (Brown et al., 2014).

Long-standing trends of eating disorders surround women collegiate athletes (Black & Burckes-Miller, 1988; Greenleaf et al., 2009). Women athletes are prone to using diuretics and laxatives to control their weight in order to improve satisfaction with their body image (Piacentino et al., 2017). Though men are less likely to develop an eating disorder (Galli et al., 2014), wrestlers have been shown to be the most likely to develop an eating disorder and use substances in order to address coach and teammate pressure to lose or gain weight for weight-in, to enhance sport performance, or to gain more playing time (Baum, 2006; Chatteron & Petrie, 2013). These unhealthy practices can deteriorate athletes' mental and physical health.

Lastly, alcohol and marijuana have been shown to have negative effects to athletes' achievements on and off the pitch. Recent studies found negative side effects such as decreased concentration and attention levels from marijuana consumption, which can inhibit athletic and scholastic performance (NCAA, 2017). Literature on marijuana use exhibits strong positive correlations between chronic marijuana use and cognitive defects. Research by the NCAA (2017) found those who used marijuana in the past month were three times more likely to report failing grades than those who did not use marijuana. This study also highlighted 25% of athletes reportedly missing class and 16% performing poorly on a test or in practice due to alcohol use.

Prevalence

Alcohol Use. Research by the NCAA found 77% of student-athletes reported consuming alcohol within a 12-month period (NCAA, 2017). Researchers for the NCAA (2017) found 42% of student-athletes within member institutions engaged in binge drinking within a 12-month period. Gender did not appear to be a significant predictor in alcohol use amongst NCAA student-athletes (NCAA, 2017). Research by the NCAA (2017) found 76% of men and 79% of women consumed alcohol on a yearly basis. Men student-athletes (44%) were slightly more likely than women student-athletes (39%) to engage in binge drinking episodes. Researchers at the NCAA (2017) did find a student-athlete's level of competition was a predictor in alcohol

consumption. Division III athletes consumed alcohol on a yearly basis at a higher rate (81%) than Division II (74%) and Division I (75%) athletes. Compared to the overall non-athlete college population (78.9% to 81.3%), research by the NCAA found student-athletes showcased similar trends of alcohol use (77.1%) (NCAA, 2017; Schulenberg et al., 2017; SIUC/Core Institute, 2013). The highest rates of reported binge drinking by sport were in lacrosse, hockey, and swimming.

Drug Use. The percentage of NCAA student-athletes who self-reported their ingestion or inhalation of marijuana was 25% (NCAA, 2017). This was 14% lower than 39% overall college student use found in the MTF survey (Schulenberg et al., 2017) Marijuana use was significantly higher in states where use is legal as compared to states where marijuana is not legal. Athletes identifying as men and athletes competing in the NCAA Division III level were found to be at the highest risk for using marijuana (NCAA, 2017). Marijuana was used most by lacrosse athletes (50% men lacrosse athletes, 34% women lacrosse athletes). The most reported reason for use in the past year was for social purposes (77%). Other commonly reported reasons were 26% to aid sleep, 22% for anxiety or depression, and 19% for pain management.

Reported use of amphetamines among NCAA student-athletes was 2%. This number is less than the 9.8% of the overall college population reporting use in the MTF survey (NCAA, 2017; Schulenberg et al., 2017). Amphetamines were used more by athletes identifying as men (2.1%) than women athletes (0.7%) (NCAA, 2017). Men lacrosse athletes used amphetamines the most (6.7%). Among women sports, lacrosse athletes (1.9%) were the most likely to use amphetamines in the past year. Anabolic steroids were also more commonly used among men (0.6%) than women (0.1%). Men wrestlers were noted as the most prevalent users of anabolic steroids (1.9%). Tennis and soccer teams were ranked as the highest consumers of anabolic steroids among women sports (NCAA, 2017).

Illicit drugs were consumed by athletes identifying as men more often than women athletes (NCAA, 2017). Cocaine use of student-athletes was similar among NCAA athletes and non-athletes with a self-reported rate of 4% use in the past year (Schulenberg et al., 2017). Lacrosse athletes reported the highest rate of cocaine use in men's and women's sports (NCAA, 2017). Senior-level athletes were the primary users of cocaine (5.0%). Furthermore, 11% of student-athletes reported using narcotic pain medicine with a prescription (NCAA, 2017). 2% of student-athletes reported misusing narcotic pain medicine (NCAA, 2017). Women's gymnastics reported the highest prevalence of narcotic pain medication (18%). Other sports reporting the highest total were 13% (softball), 13% (ice hockey), and 12% (lacrosse) (NCAA, 2017). Among men's sports, lacrosse reported the highest use of narcotic pain medication (17%). Reported ADHD stimulant use without a prescription was 8% as compared to use with a prescription (7%) (NCAA, 2017). ADHD stimulants were most used by American Indian or Alaskan Native (16%) and senior and junior (14.7% and 14.6%) student-athletes. In the past year, Ecstasy/Molly users were most likely men (2.4%), Asian or Asian American, Native Hawaiian or Pacific Islander, and Multiracial (3%), and sophomore, junior, and senior level athletes (2.2%) (NCAA, 2017). The most prevalent LSD users were American Indian or Alaskan Native (3%), men (2.3%), and sophomore (2.0%) athletes (NCAA, 2017). No significant findings were suggested from methamphetamine or heroin use (NCAA, 2017).

Tobacco Use. The percentage of NCAA student-athletes who smoked tobacco products was 19% (cigars), 11% (cigarettes), 10% (hookah), and 8% (e-cigarettes) (NCAA, 2017).

Additionally, 13% of NCAA student-athletes reported using spit tobacco, with 5% of athletes reporting daily use (NCAA, 2017). Athletes identifying as men were found to be significantly more likely than women athletes to use tobacco products. Rates of cigarette use are significantly lower in the student-athletes population (10.5%) as compared to the 18.7% of the overall college population reporting use in the MTF survey (NCAA, 2017; Schulenberg et al., 2017). Cigarette users were primarily men (14%), white (13%), junior (11.2%), and lacrosse (38%) athletes (NCAA, 2017). Spit tobacco users were mostly white (16%), men (21.8%), ice hockey or baseball (35% and 44%), and junior (14.7%) athletes (NCAA, 2017). The highest percentage of NCAA (2017) athletes reported using spit tobacco to prepare for practice (5.8%).

Current Study

Gaps in the Literature. The National Association of Intercollegiate Athletes (NAIA) did not have data available on the alcohol, drug, and tobacco use among their 65,000+ student-athletes competing across approximately 250 member schools. As evident in the work of the NCAA (2017), the NAIA understood there were potential alcohol, drug, and tobacco use and abuse challenges impacting the biopsychosocial development of their athletes. These are challenges that could impact an athlete in a number of ways, some far-reaching one's time at a university (CBHSQ, 2018).

The current study used the NCAA Student-Athlete Substance Use Survey with a sample of NAIA student-athletes, while taking into consideration some measures to collect data in an effective and authentic fashion. This afforded NAIA members and the National Office staff to gain a clearer picture of the student-athlete needs and next steps for promoting necessary, holistic athlete health and safety measures. Additionally, these results could help the NAIA create a comparison between their student athletes, NCAA student-athletes, and the larger non-athlete college population. Limited research exists to date comparing the NCAA, NAIA, and the overall college student population.

Such research is necessary as there are significant differences in NAIA and NCAA operations that could explain potential differences in substance use and abuse. From a purely demographic standpoint, the average full-time enrollment of an NAIA program is 1,400 students (2,750 students for an NCAA DII program and 4,500 students for an NCAA Division III program). 82% of NAIA programs are private institutions as compared to 58% of NCAA programs. 65% of NAIA programs are faith-based, while less than 50% of NCAA programs have a faith-based affiliation. The NCAA sponsors 24 sports compared to 18 for the NAIA. There are also significant differences in operating budgets. NAIA programs spend \$3 million less than NCAA Division II programs and \$2 million less than NCAA Division III programs.

In addition to these demographic differences, there are also vast differences in the amount of resources allocated for the development of safety, excellence, and wellness programs that foster student-athlete development in the NCAA as compared to the NAIA. The NCAA has the Sport Science Institute, which works collaboratively with NCAA membership, with the Committee on Competitive Safeguards and Medical Aspects of Sports, with medical and research experts, and with sports medicine and other medical organizations to develop Interassociation consensus documents and educational resources to assist member institutions in their effort to holistically provide for student-athlete health and safety (NCAA, 2020). The NAIA does not have this level of funding or resources allocated for matters such as substance use and abuse. It is for these reasons that such research is necessary to establish a baseline for current

trends in the NAIA and how these trends mirror or differ from what is already known about NCAA athletes and the larger college student population.

Research Questions. To this end, the aims of the current study were to explore two questions: (1) What are the current levels of NAIA student-athlete alcohol, drug, and tobacco use? (2) What are the rates of NAIA student-athlete use compared to NCAA athletes (using the 2017 NCAA Student-Athlete Substance Use Survey) and the larger non-athlete college population (using the MTF survey)?

Methods

Research Design

The current exploratory study utilized a cross-sectional, web-based survey design to gather data from NAIA college athletes. Considering the size of the NAIA student-athlete population, confidence level, confidence intervals, and statistical power, the minimum sample for this study needed to be 1,300 student-athletes. With this sample size, researchers proposed a 95% confidence level that the findings from the sample would be generalizable to the larger NAIA student-athlete population (Faul et al., 2007). Researchers targeted athletic trainers through the NAIA database to establish contact information. Athletic trainers administered the survey rather than Faculty Athletic Representatives (FARs) used by the NCAA (2017). Most NAIA programs do not utilize a FAR. This was a deviation from the NCAA study, which is discussed in greater detail in the study limitations sections. This was the only deviation from the NCAA efforts, yet was a potentially significant deviation.

Sampling. The exploratory study utilized a stratified random sampling procedure to identify student-athlete participants. Researchers divided the NAIA student-athlete population into subgroups, or strata, based on sports available throughout the NAIA. This included a stratum for each of the 14 sports with separate stratum for each gender (and division level for basketball) that participates in a sport. Next, researchers identified NAIA member institutions that participated in each of the 14 sports. Each institution participating in a sport received a random number. Researchers selected random numbers to identify the member institutions that would participate in the survey from each sport. The total number of sampled athletes from each stratum was proportional to the overall population based on the desired sample size. This approach ensured all member institutions participating in various sports had an equal opportunity for inclusion in the survey. Researchers predicted only 3-5% of athletes would respond to the web-based survey. This anticipated response rate is consistent with many studies using web-based surveys (Hoonakker & Carayon, 2009; Munoz-Leiva et al., 2010) and the studies conducted by the NCAA (2017).

Participants

Voluntary participants aged 18 years old or older were included in the current study ($n = 2,489$). All participants had to be student-athletes competing for a NAIA member institution in order to be eligible to complete the survey. Most participants were 18-21 years old (67%, 33% indicated being over the age of 21). Survey participants were primarily “first year” students

(34%, 23.1% sophomore, 22.8% junior, 18.8% senior, 1% graduate). Slightly more men completed the survey (51.2% men, 48.8% women). Most participants who reported race/ethnicity were White/Caucasian (57%, 16.8% Hispanic or Latino, 16.2% Black or African American, 5.2% multiracial, 4.7% “other”). A summary of these descriptive statistics can be found in Table 1. Participants recorded which NAIA athletic team they were primarily affiliated with (18% football, 11.9% soccer, 11.4% track and field, 9.4% baseball, 8.8% basketball, 7.4% volleyball, 33.1% other sports [e.g., tennis, cross country, golf, softball, wrestling, cheer, dance, bowling, swimming and diving, and lacrosse]). Participants were further examined regarding funding sources, transfer status, current living situation, NAIA college/university demographics, perceived likelihood of competing professionally, and current NAIA drug testing education (See Table 2).

Table 1
NAIA Student-Athlete Demographics (N = 2,489)

Demographic Characteristic	N	%
Age		
18-21	1,668	67%
Over the age of 21	821	33%
Gender		
Male	1,269	51.2%
Female	1,220	48.8%
Race		
White/Caucasian	1,419	57%
Hispanic or Latino	423	16.8%
Black or African American	398	16.2%
Multiracial	125	5.2%
Other	124	4.7%
Class Standing		
First Year	846	34%
Sophomore	573	23.1%
Junior	572	22.8%
Senior	473	18.8%
Graduate	25	1%

Table 2
NAIA Institutional Demographic Information

University Demographics	N	%
Private	2061	83.3%
Public	414	16.7%
Suburban	963	37.7%
Rural	864	34.8%
Urban	682	27.5%
Faith Based	1891	76.3%
Non-Faith Based	588	23.7%

Measures/Instruments

Participants completed a web-based, edited version of the quantitative NCAA National Study of Substance Use Habits of College Student-Athletes Survey (2016). This is a valid and reliable measurement tool (NCAA, 2017). The survey contained four main sections: (1) institutional and background information (e.g., age, race/ethnicity, year in school, sport, funding sources, transfer status, living situation, etc.), (2) substance use experience (e.g., current substance use rates, reasons for use, reported first-use, etc.), (3) performance enhancers and dietary supplements (e.g., rate of use, type of performance enhancers/type of supplements used), and (4) drug testing beliefs. Similar to the NCAA (2017) survey, athletes were asked questions about the following substances: alcohol, tobacco products, illicit drugs (e.g., marijuana, cocaine, LSD), ergogenic aids (e.g., amphetamines, anabolic steroids, human growth hormone), over-the-counter medications (e.g., ADHD stimulants), and prescription drugs (e.g., pain medications). The NCAA (2017) survey and the NAIA survey were congruent throughout, apart from some modifications in the institutional and background section. Some modifications and additions were made to the NCAA (2017) survey in order to grasp additional data from NAIA student-athletes and gain a clearer understanding in order to address research questions. One addition to the NAIA survey was the description of athletes' college or university they attend.

Procedure

Data Collection. Researchers contacted the athletic training staff at all NAIA member institutions. The research team believed the athletic training staff would provide consistent help with data collection across NAIA institutions. Athletic training staff was provided with the list of teams from their institution for inclusion in data collection. This information was also shared with the college or university Athletic Director to promote accountability and offer support for the athletic training staff. Researchers provided athletic training staff detailed instructions for data collection and a copy of the informed consent. Athletic training staff met with each of the selected athletic teams and had the team anonymously complete the survey on one occasion in a classroom-type setting to attempt to standardize administration. Athletic training staff was present in the room with the student-athletes only during survey completion. Athletes were able to opt-out of the survey at any time. Survey data was conducted on a complete, voluntary basis. The NAIA Substance Use and Abuse Survey took approximately 15-20 minutes to complete. Once data was collected across NAIA institutions, researchers recorded survey results into a statistical software program (SPSS) on a secure, private platform.

Data Analysis. Researchers utilized descriptive statistics to provide details about the sample and overall survey results. Researchers used inferential statistics to infer information from the sample data to the overall NAIA student-athlete population.

Results

Substance Use and Abuse

Alcohol. Overall, 49.2% of NAIA student-athletes reported drinking within the last year. This is approximately 28% less than reported by NCAA student-athletes (77%) and 30% less than reported by the MTF study of the general student population (79%, See Figure 1). 19.6% of all NAIA student-athletes reported binge drinking. The NCAA study indicated 42% of athletes reported binge drinking (See Figure 2). The highest rate of binge drinking by NAIA sports was lacrosse (54.4%), baseball (37.5%), and football (31.7%).

Figure 1.
 Prevalence of Alcohol Consumption in the Past Year

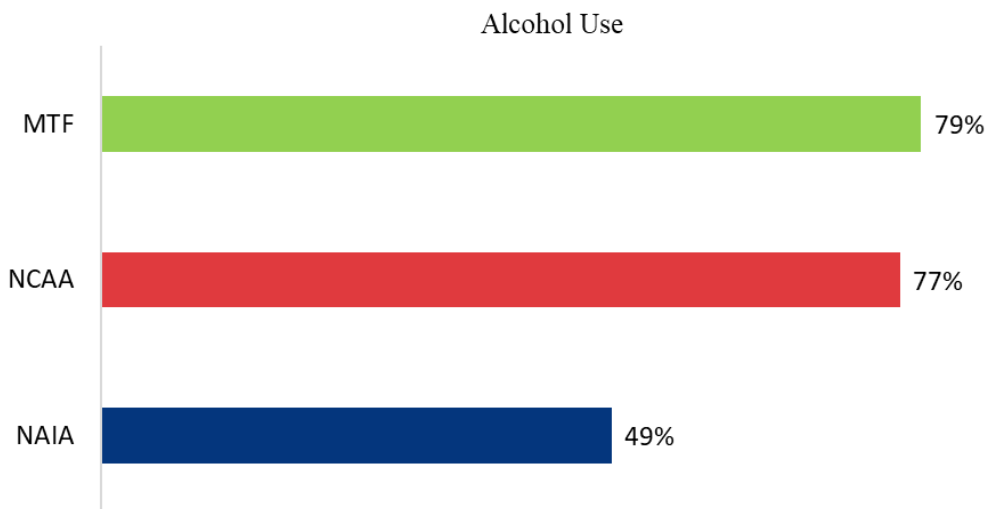
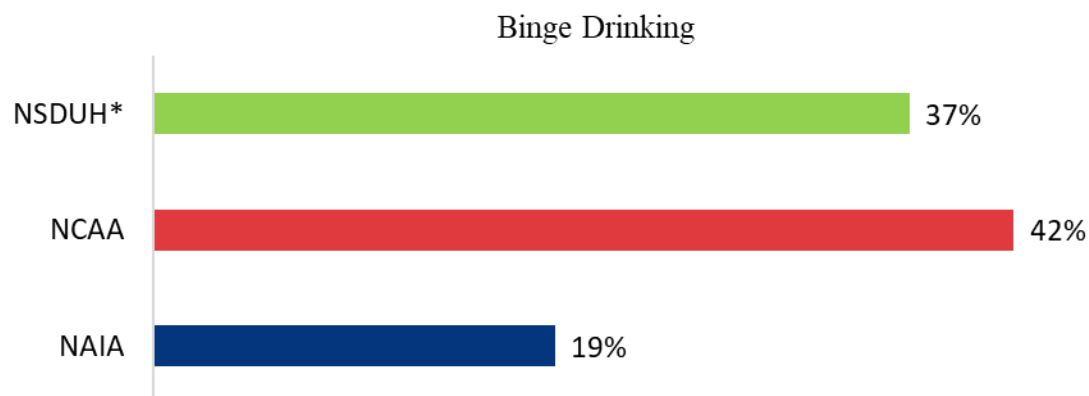


Figure 2.
 Prevalence of Binge Drinking in the Past Year



*Prevalence in the past month

Men were more likely to be consumers of alcohol than women (52% men). White/Caucasians reported the highest percentage of users (69%, 12.2% of Hispanic or Latino, 10.7% Black or African American). Graduate students reported having used alcohol the most (90.5%, 71.2% seniors, 51.8% juniors, 47.0% sophomores, 35.5% first-year students). In the past year, 72.7% of lacrosse players reported using alcohol, followed by competitive dancers (71.1%) and bowling athletes (62.2%).

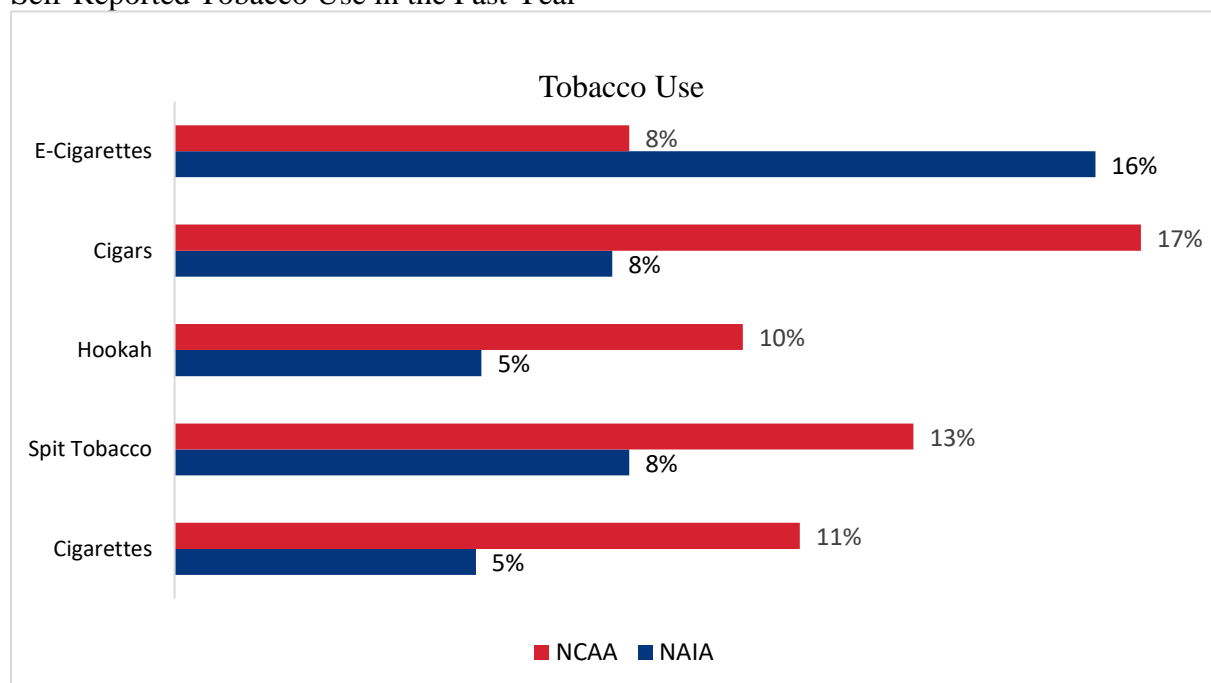
NAIA athletes reported problem outcomes from drinking alcohol. In the past year, 25.6% of NAIA athletes reported experiencing a hangover after drinking. 11.3% indicated they did something regretful after drinking. 10.5% of all NAIA athletes forgot where they were or what they were doing after drinking. 10.5% reported having unprotected sex. 8.8% reported having been criticized by others about their drinking. 7.1% reported having trouble sleeping due to alcohol consumption. 6.8% reported getting into a fight or an argument after drinking in the past year. 6.3% reported missing classes because of drinking. 5.5% of NAIA student-athletes reported riding in a car with someone who was drinking.

Nicotine. The most frequently used smoke tobacco products were e-cigarettes (16.2% smoked at least once in the past year), followed by spit tobacco (8%), cigars (7.7%), and hookah (5.4%). 4.6% of student-athletes reported using e-cigarettes daily. 8% of student-athletes reported using spit tobacco at least once in the past year (95.9% men, 4.1% women). 39.5% of baseball players reported using spit tobacco in the past year.

Compared to NCAA athletes, NAIA athletes reported lower rates of cigarette, spit tobacco, hookah, and cigar use. NAIA student-athletes reported more than double the rate of E-Cigarette use compared to NCAA athletes (16.2%, 8% NCAA, See Figure 3). The NAIA rate was nearly identical to rates of e-cigarette use in the MTF survey. Of those completing the survey, E-Cigarette use was primarily men (63.4%).

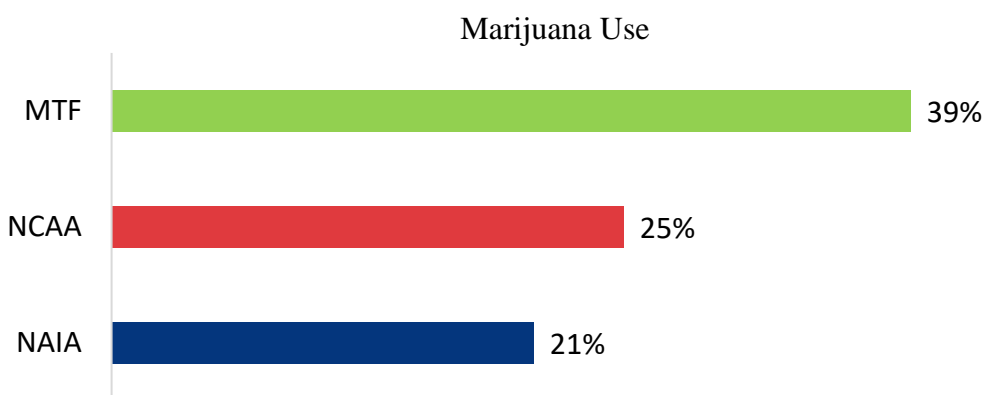
Figure 3.

Self-Reported Tobacco Use in the Past Year



Marijuana. 20.6% of NAIA student-athletes used marijuana within the past year (inhaling or ingesting). 40% of marijuana users reported doing so to aid symptoms of anxiety or depression, 60% for social reasons, 38% to aid sleep, and 39% for pain management. Of those who reported ingesting marijuana, the highest percentage of users described themselves as men (95.9%), Caucasian/White (62.2%; 14.5% Black or African American, 15.7% Hispanic or Latino), first year or senior (26.9% and 24.0%). Lacrosse athletes reported the highest percentage of users among sport teams (18.1%; 15.6% competitive dance, 13.2% baseball). Men represented a higher percentage of marijuana inhalant users (55.5%). 36.4% of lacrosse athletes and 21.7% of baseball athletes self-reported inhaling marijuana at least once in the past year. The highest percentages of those who inhale marijuana were Caucasian/White (64.3%; 15.0% Black or African American, 13.8% Hispanic or Latino) and seniors (35.5). Overall, NAIA athletes reported a lower percentage of marijuana use (inhaling or ingesting) than NCAA athletes (25%) and Non-Athletes (39%, See Figure 4).

Figure 4.
Self-Reported Marijuana Use in the Past Year



Illicit Substances. LSD was the highest reported illicit drug used among NAIA student-athletes (3%). Those using LSD in the past year primarily described themselves as men (76.3%), Caucasian/White (76.3%) and senior (42.1%). Among athletic teams, lacrosse reported the highest percentage of those who have used LSD (18.2%). Cocaine users were mostly men (69.4%), Caucasian/White (61.1%) and senior (38.8%). Lacrosse athletes were the highest reported users of cocaine (9.1%).

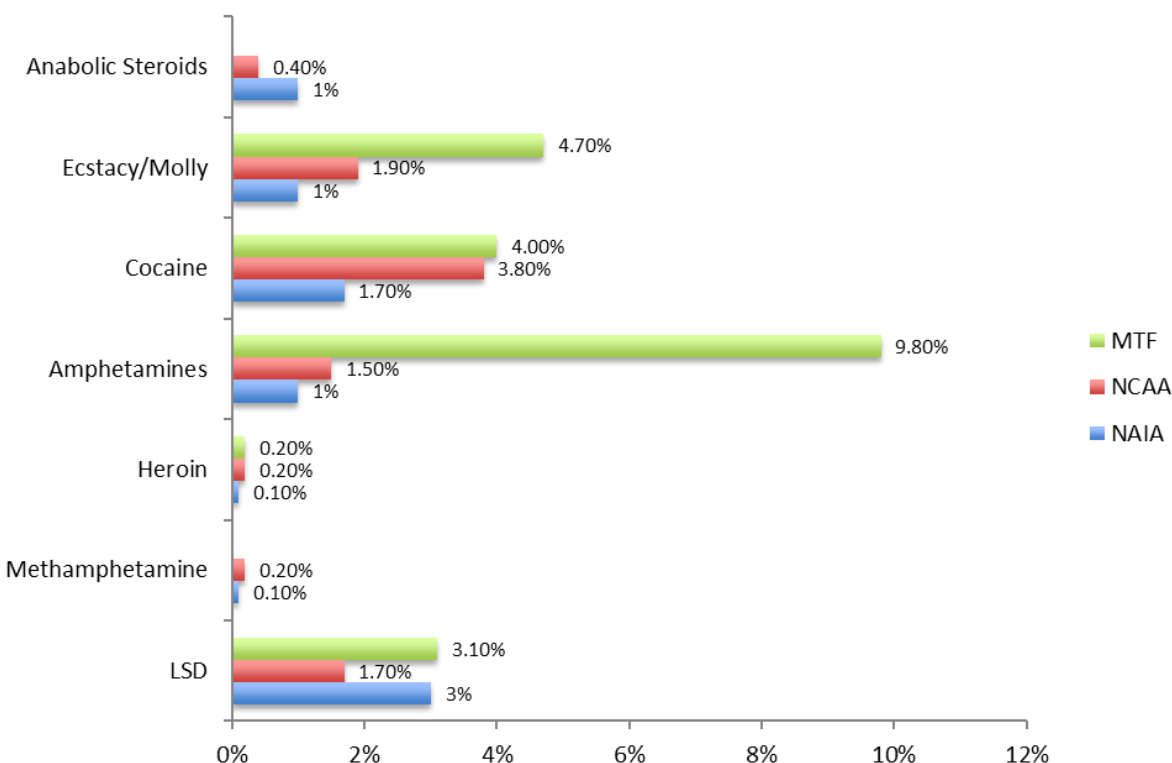
In this sample, 0.8% of all student-athletes identifying as men used anabolic steroids and 0.3% used HGH. Sports at greater risk for anabolic steroid and HGH use included basketball, baseball, football, lacrosse, and competitive cheer. Athletes identifying as White/Caucasian represented the largest racial or ethnic group of steroids and HGH use. See Figure 5 for a comparison of NAIA, NCAA, and MTF data.

Prescription Drugs and ADHD Stimulants. 9% of student-athletes reported using narcotic pain medication with a prescription (NCAA = 11%) in the last year. 2% of student-

athletes reported using narcotic pain medication without a prescription (NCAA = 3%) in the last year. 4.5% of student-athletes reported using ADHD stimulants with a prescription (NCAA = 6.6%) in the last year. 3% of student-athletes reported using ADHD stimulants without a prescription (NCAA = 7.5%) in the last year.

Onset and Purpose of Use. NAIA athletes' onset of first use regarding alcohol, cigarettes, e-cigarettes, spit tobacco, and marijuana was most prevalent in high school. First use of illicit substance was primarily in college, unless referring to steroids and HGH, where onset began in high school. Most NAIA student-athletes reported using alcohol, tobacco products, and marijuana only during off-season. Athletes reported reasons as to why they do not use substances. The top reasons for athletes who do not use substances were unanimously (1) no desire for side effects and (2) concerns about health implications.

Figure 5.
Illicit Drug Comparison Data for a 12-month period.



Note: Illicit substance use percentages represent use in the last year.

Discussion

Researchers explored the current levels of NAIA student-athlete alcohol, drug, and tobacco use. Researchers compared the NAIA findings to those of NCAA student-athletes and non-athlete college population. There were multiple significant findings within this original research study. The following sections review key findings for each of the research areas.

Significant Findings

E-Cigarettes. One of the most significant findings within the current study was the prevalence of e-cigarette use among NAIA athletes. NAIA athletes had more than twice the percentage of prevalence as NCAA athletes. One potential explanation for this is the recent trend of e-cigarette use (Schulenberg et al., 2017). Research shows the past couple years saw a boom in rates of e-cigarette use (Ickes et al., 2019; Schulenberg et al., 2017). The NCAA data is older than the NAIA data, and may not capture this recent trend. A second potential explanation, as noted within the literature, suggests college students are often influenced by their peers and perceived social norms. As the e-cigarette movement continues to spread on campus, it could be causing more individuals (including athletes) to try the products (Ickes et al., 2019).

Alcohol Use. Rates of alcohol use by NAIA athletes (49.2%) were significantly lower than those of NCAA athletes (77%) as well as rates found in the MTF survey for the overall college population (79%). There are several possible explanations for these lower rates. First, the NAIA does have higher rates of faith-based institutions than the NCAA. Study findings suggest religious beliefs contribute to reduction of alcohol use (Moore, Berkley-Patton, & Hawes, 2013; Ginn et al., 1998). Second, NAIA colleges and universities do not have as large of Greek life systems as programs affiliated with the NCAA. Greek life systems are linked with higher rates of alcohol consumption (National Institute on Alcohol Abuse and Alcoholism, NIAAA, 2020). Third, NAIA programs do not have nearly as many athletic programs with nationwide attention, such as programs affiliated with NCAA Division I. The NIAAA links alcohol consumption with college and universities that have prominent and well-known athletic programs. Fourth, 33% of the current study's participants reported living at home with parents or other relatives.

Team Sports. Another significant finding within the current study mimicked results found with the NCAA (2017) study. The most prevalent substance use among NAIA athletes were found among team sports. These results coincide with the ideology of team sports impacting (raising) the likelihood of substance consumption (Brenner & Swanik, 2007; NCAA, 2017). Among the substances most consumed by team sports, overall marijuana use among NAIA athletes offered other significant findings. White/Caucasian, men, lacrosse athletes reported consuming marijuana at the highest rate among NAIA athletes. Furthermore, marijuana inhalation and ingestion use rates among NAIA athletes closely resembled use among NCAA (2017) athletes.

Narcotic and Pain Medication. Results indicated narcotic pain medication use among NAIA athletes closely resembled NCAA athlete use (NCAA, 2017). Narcotic pain medicine was among the most prevalent drugs used specifically to prepare for practice in NCAA athletes. This was the most reported substance used by NAIA athletes to prepare for practice (along with ADHD stimulants). As outlined within literature, the percentage of student-athletes prescribed narcotics for pain medication is much higher than the general student population due to athletic injuries and pain attributed to competitive athletics (NCAA, 2017). This warrants a special level of concern for NCAA and NAIA athletes given the potential for addiction among narcotics (Brown et al., 2014).

Finally, rates of LSD use among NAIA athletes surpassed (nearly doubled) NCAA student-athletes' LSD consumption and closely resembled rates of their non-athlete peers. Those

who used LSD were mostly White/Caucasian, men, and senior athletes. This significant finding is especially concerning as it is a drug that alters thoughts, feelings, and one's overall awareness. These side effects can greatly contribute to negative effects on an athlete's ability to perform athletically and academically.

Study Limitations

First, as being the first study to directly examine NAIA substance use and abuse rates as well as compare NAIA, NCAA, and non-athlete population data, this research must be considered as exploratory rather than an explanatory study (Moore, 2017). Second, while efforts were made to decrease discomfort with the survey, it is possible athletes felt pressure to respond in particular ways out of personal and/or athletic concerns. This study also relied upon self-reported data. Without having the ability to verify participant responses, there was no way of knowing the legitimacy or honesty of participants' responses.

Third, the measurement tool used was a modified version of the NCAA Substance Use and Abuse Survey. While the researchers maintained a strong fidelity to this survey, little is known about the reliability and validity of the survey with the changes for the NAIA population. Fourth, the study was unable to control the multiple covariates or confounding variables that influence an athlete's decision to use or not to use substances. While the study provided descriptive information, it is difficult to determine the true underlying causes for use or abuse.

Fifth, the use of athletic trainers instead of FARs is potential concern. Most student-athletes rarely interact with their FAR. In contrast, student-athletes are likely to know their athletic trainer well and interact with them on a regular basis. Further, an athletic trainer is tasked with providing care for student athletes, which might impact responses to a survey about substance use and abuse. This limitation could impact the comparability between NAIA, NCAA, and MTF data.

Study Implications and Future Directions

Projects of this nature aim to provide student athletes with the greatest environment to cultivate safety, excellence, and wellness through research, education, best practices, and collaborations with member schools and their student-athletes, the NAIA national office, and community partners. This research supports the aims of the NAIA in promoting and developing an environment where student-athletes foster lifelong physical and mental development and promote necessary life skills for character and leadership development.

The primary goal of this research project was to collect and analyze data on current student-athlete behaviors. Upon collecting and analyzing data, the NAIA is now in a stronger position to make informed decisions that support the safe and healthy development of their student-athletes. There are several future directions that arise from these findings. First, the NAIA might consider hosting topic-specific summits and task forces related to athlete substance use and abuse in order to develop best practice recommendations. This could be similar to the work the NCAA did to create the Substance Abuse Prevention Toolkit (NCAA, 2020). An NAIA toolkit could focus on the significant findings that are unique to their membership.

Second, the NAIA could create an advanced research agenda to further understand significant findings that manifested from the current study. This could include facilitating the

survey on a quadrennial basis like the NCAA (2020). Additionally, the NAIA could also collect data about the drug-testing and education efforts of member schools. The NAIA has made changes to their drug-testing policies, which would benefit from an institutional drug education and testing survey.

Third, there is a need for the development of educational materials for NAIA athletes, coaches, athletic trainers, support personnel, and administrators. This might include in-person training, webinars, fact sheets, and social media efforts around performance enhancing drugs, alcohol and other recreational drug prevention, dietary supplements, etc.

Overall, studies of this nature could lead to future partnerships around other physical, psychological, and social factors impacting the competitive and lifelong success of student-athletes. Substance abuse and use has strong connections to other behavioral health concerns of athletes. This could include further exploration of mental health, interpersonal violence, sleep disorders, injury response, and matters of racial injustice. All of these areas would benefit greatly from data-driven efforts employed in this study.

Conclusion

Longstanding research has tracked student-athlete substance use patterns in order to address the substance abuse issues that take place on their college campuses. This paves the way for colleges and universities to develop a plan that offers health and safety options to student-athletes. These plans must consider many factors. For instance, student-athletes are constantly put under an exorbitant amount of pressure to maintain stellar academic and athletic performances all while attempting to fit in with the overall college population and have a “normal” college experience (Moore, 2017). These pressures can serve as a double-edged sword, both preventing and causing individuals to engage in substance use and abuse. To be successful in their mission to promote the health, safety, and well-being of their student-athletes, the NAIA must take logical action steps to ensure each of their athletes has the mind, body, and character to successfully navigate the current substance use and abuse culture on their campuses.

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