

COLLEGIATE ATHLETES' KNOWLEDGE OF THE EFFECTS OF ALCOHOL
CONSUMPTION ON ATHLETIC PERFORMANCE

A THESIS

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THESIS APPROVAL

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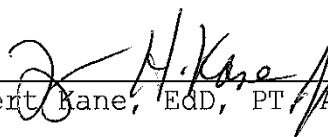
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TABLE OF CONTENTS

	Page
SIGNATURE PAGE	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
INTRODUCTION	1
METHODS	6
Research Design	6
Subjects	7
Preliminary Research	7
Instruments	8
Procedures	9
Hypotheses	11
Data Analysis	12
RESULTS	13
Demographic Data	13
Hypothesis Testing	16
Additional Findings	19
DISCUSSION	29
Discussion of Results	29
Conclusions	34

Recommendations	35
Policy Recommendations	35
REFERENCES	37
APPENDICES	40
APPENDIX A: Review of Literature	41
Introduction	42
Athletes vs. Non-athletes	43
Drinking Habits	45
Alcohol's Effect on Performance	48
Athlete's Knowledge of Alcohol's Effect on Performance	52
Summary	54
APPENDIX B: The Problem	55
Statement of Problem	56
Definition of Terms	57
Basic Assumptions	57
Limitations of the Study	58
Significance of the Study	58
APPENDIX C: Additional Methods	60
Knowledge about Alcohol Questionnaire (C1)	61
IRB: California University of Pennsylvania (C2)	65
Cover Letter (C3)	76
Coaches Informational Letter (C4)	79
REFERENCES	81

ABSTRACT 84

LIST OF TABLES

Table		Page
1	Frequency Table of Sport	13
2	Frequency Table of Year in College	14
3	Frequency Table of Sports	14
4	Frequency Table of Age	15
5	t-Test between Gender & Total Score	16
6	t-Test between Type of Sport & Total Score	17
7	One way ANOVA between Total Score & Frequency of Alcohol Consumption	18
8	Mean Scores for Frequency of Alcohol Consumption	19
9	t-Test between NCAA Divisions & Total Score	20
10	t-Test between student athlete's Hangover Practice and Game Status and Total Score	21
11	t-Test between Age and Total Score	22

LIST OF FIGURES

Figure		Page
1	Drinking Habits Question 1	23
2	Drinking Habits Question 3	24
3	Drinking Habits Question 5	24
4	Drinking Habits Question 6	25
5	Drinking Habits Question 7	26
6	Drinking Habits Question 8	26
7	Drinking Habits Question 9	27

INTRODUCTION

For many young adults, going to college is their first time living on their own without parental supervision. After leaving home, there is a newfound sense of freedom and college students are introduced to a new social environment where it is common to experiment with alcohol. It is even more common for alcohol consumption to take place if the student participates in athletics. In spite of all the negative consequences associated with alcohol, there is evidence that alcohol is a prominent factor in the lifestyles of many athletes at all levels of competition.¹ The idea that athletes consume alcohol more frequently and more often to the stage of intoxication than do non-athletes is well documented.²

There are a number of reasons why athletes are considered an at risk population for alcohol consumption. Wilson et al² examined if there was a difference in the reasons behind alcohol consumption between female and male athletes. The results indicated that the female athletes included in this study reported using alcohol more commonly as a coping mechanism (e.g. using alcohol to feel better or "to get through the problem") rather than a social

facilitator. The male athletes included in this study reported using alcohol most commonly as a way to "get high" and for social reasons. Other research indicates that the challenges associated with being a student-athlete put them at higher risk for having problem drinking characteristics. These challenges can include dealing with multiple role demands and the high expectations of coaches as well as professors and balancing time between school work, practices, competitions, and social lives.³

The relationship between alcohol and athletes has been long standing. Researchers have suggested that alcohol is widely used because it continues to be a social facilitator. The experience of a new environment, such as college, allows students to look to their social groups to determine what attitudes and behaviors are expected and appropriate. Ford examined alcohol use between athletes and non-athletes and generalized that athletes are in a "peer intensive" state, in which, they tend to only socialize with their teammates or other people associated with athletics. Therefore, if consuming alcohol at team functions and weekend parties is the norm athletes will be influenced to participate in drinking alcohol or risk being labeled as anti-social.⁴

There are a number of negative effects alcohol can have on the body and on athletic performance. Athletes may not fully understand how consuming alcohol will affect their ability to perform on the court or field. El-Sayed et al states alcohol use is directly related to the number of injuries sustained in sporting events and appears to have detrimental effects on performance capacity⁵. Most people know and understand the acute effects of alcohol include a variety of psychomotor defects such as impaired balance, reaction time, and coordination. However, there are also a variety of effects alcohol can have for extended periods of time. Alcohol impairs muscular work capacity which in turn, results in decreased over performance levels such as slower running and cycling speeds. Alcohol will also increase the onset of fatigue during high intensity exercise and impair temperature regulation during exercise.⁶ Glucose is an extremely important source of energy during exercise that is synthesized in the liver and when there is even low amounts of alcohol being digested in the liver it can seriously impair glucose production during prolonged moderate intensity exercise.⁷

Most athletes understand that the body needs to recover after exercise; however, are unsure of the proper physiological needs to recover properly. Rehydrating after

practice or competition is extremely important as it allows for maximal recovery, thus preparing the body for the next exercise session. Alcohol, due to its diuretic effect, delays the recovery process by promoting urine loss and keeping the body in a dehydrated state.¹ Also, not only is the risk of sustaining an injury increased while consuming alcohol but the ability of a trauma-related immune response is hindered. Even a single occasion of moderate to heavy drinking will negatively affect the body's immune system response abilities such as the attenuation of inflammatory cell functions.⁸

There is much attention on the use of steroids and performance enhancing drugs in the sporting world but the most frequently consumed and least talked about drug in athletics is alcohol. Therefore, it is important for athletes to understand all the effects alcohol can have on their body, performance, and life. Some schools have recognized this importance and have implemented a requirement for an alcohol education course during their high school education or during their freshman year in college. This is one example of how to help address alcohol related problems associated with colleges but it does not target student-athletes. It would be beneficial for athletic departments to provide a course for student-

athletes that addresses alcohol education. This education, for both students and coaches is the cornerstone in combating this problem.⁹

METHODS

The primary purpose of this study was to examine the amount of knowledge collegiate athletes have in regards to the effects of alcohol consumption on athletic performance. This section includes the procedures used to carry out the purpose of this research study and it includes: research design, subjects, pilot testing, instruments, procedures, hypotheses, and data analysis.

Research Design

The research design for this study was descriptive. The dependent variable in this study was knowledge of the effects alcohol consumption will have on athletic performance. The independent variables were gender and the type of team (i.e. individual sports members and team sports members). The strengths of this study were that athletes from more than one NCAA division were included and the instrument used was a reliable questionnaire approved by a panel of experts. A limitation of this study was that only athletes from a limited geographical region were surveyed.

Subjects

The subjects that were used are athletes from California University of Pennsylvania, Penn State Fayette - the Eberly Campus, Penn State Greater Allegheny, Washington and Jefferson College, and Frostburg State University. The reliable questionnaire was distributed to all NCAA athletes enrolled at the participating institutions.

Preliminary Research

Questions were developed by the researcher based on preliminary research of the topic. The questionnaire was reviewed by a panel of experts that included Dr. Robert Kane, Dr. Bruce Barnhart, and Mr. Adam Annaccone, before it was distributed. This panel could be considered experts in the field of Athletic Training because they have over 5 years of experience working as professionals and they have knowledge on the subject matter beyond the scope of the average population. Upon review the panel of experts believed the knowledge question type should be a true and false format instead of on a Likert Scale.

Instruments

The Alcohol Knowledge Questionnaire (Appendix C1) examined athlete's drinking habits and their knowledge of the effects consuming alcohol has on athletic performance. This questionnaire had three sections: demographics, drinking habits, and knowledge. Within the demographics section, questions about gender, sport, school, age, and year in school were answered.

The drinking habits section required athletes to establish how often they drank, how often they get drunk, what types of drinks they consume, and with whom they usually drink. Questions regarding whether or not alcohol has ever affected their academics, athletic performance, personal life, or professional responsibilities were also examined.

For the section on knowledge, the purpose was to determine whether or not athletes understood the effects alcohol consumption can have on athletic performance. The athletes were asked if the statements made on the subject matter were true or false.

Procedure

The researcher applied for approval by the Institutional Review Board at California University of Pennsylvania (Appendix C2). After having the questionnaire reviewed by a panel of experts and upon approval by the IRB, the researcher distributed the questionnaire by way of www.surveymonkey.com. The Athletic Director at each institution was contacted and a different protocol for contacting the student athletes was created by them and followed by the researcher. The Athletic Director at California University of Pennsylvania provided the researcher with a list of email addresses for all student athletes enrolled at California University of Pennsylvania. The researcher sent a cover letter (Appendix C3) that contained the link for the survey in order for the subjects to understand the purpose of the study and to administer instructions for participation. The athletes were instructed to complete the survey honestly and without assistance from any outside sources. A follow up email was sent one week after the initial email in order to encourage the athletes to participate in the study.

The Athletic Director at Frostburg State University asked that the researcher send the necessary information to

the head coach of each Varsity sport and allow them to forward the cover letter to their athletes. The researcher emailed each coach an informational letter (Appendix C4) explaining the purpose of the study and requesting their assistance in contacting their teams. A follow up email was sent one week after the initial email in order to ask the coaches to forward the information again to encourage participation.

The Athletic Director at Penn State Fayette - Eberly Campus instructed the researcher to obtain the roster of each sport from the athletics website and then utilize the people finder search engine on www.psu.edu to find the email address for each student athlete. The researcher sent a cover letter that obtained the link for the survey in order for the subjects to understand the purpose of the study and to administer instructions for participation. The athletes were instructed to complete the survey honestly and without assistance from any outside sources. A follow up email was sent one week after the initial email in order to encourage the athletes to participate in the study.

The Athletic Director at Penn State Greater Allegheny did not provide the researcher with the email addresses of the student athletes so the researcher contacted the head coach of each sport and sent them an informational letter

explaining the purpose of the study and requesting their assistance in contacting their teams. A follow up email was sent one week after the initial email in order to ask the coaches to forward the information again to encourage participation.

The Athletic Director at Washington and Jefferson College requested that the researcher send him the information to be forwarded to the student athletes so he could contact the participants himself. The researcher forwarded him the cover letter with the information explaining the purpose of the study and the link to access the questionnaire.

Hypotheses

The following hypotheses were made based upon the literature reviewed and the insights of the researcher.

1. There will be a difference in knowledge about alcohol's effect on performance scores when comparing males and females.
2. There will be a difference between the scores on Knowledge About Alcohol Questionnaire in members of

individual sports teams and members of team sports teams.

3. Knowledge about Alcohol scores will vary significantly based on how frequently the participant consumes alcohol.

Data Analysis

To test the stated hypotheses, the significance level was set at .05 to determine the acceptability of the results. For hypotheses 1 and 2 an independent T test was used to compare two different sets of score. The difference in scores between men and women was compared for hypothesis 1 and the scores between team sports and individual sports for hypothesis 2. To determine if there were any variances between consumption rates and scores on the knowledge survey for hypothesis 3, an ANOVA test was used. All the data was be compiled and assessed by way of PASW statistics

18.

RESULTS

Demographic Data

The sample consisted of student athletes enrolled at five collegiate institutions. The sample included 200 athletes, 88 males and 112 females. Table 1 reports where the student athletes were enrolled in college. Washington and Jefferson College (W&J) had the highest response rate (56) and Penn State Fayette - Eberly Campus (PSU-Fayette) and Penn State Greater Allegheny (PSU Greater All) both had the lowest response rate (4). California University of Pennsylvania (CalU) and Frostburg State University (Frostburg State) had moderate response rates.

Table 1. Frequency Table of School of Participants

School	Frequency	Percentage
CalU	45	22.5
Frostburg State	56	28
PSU-Fayette	4	2
PSU- Greater All	4	2
W&J	91	45.5

Table 2 reports year in college. The participants were given choices ranging from Freshman to Graduate. Participants who reported being Freshman had the highest

response rate (67) and Graduate Students had the lowest (4).

Table 2. Frequency Table of Year in College

Year	Frequency	Percentage
Freshman	67	33.5
Sophomore	48	24
Junior	43	21.5
Senior	38	19
Graduate	4	2

Table 3 reports the findings for sports. The participants could select the sports they participated in from the 17 choices. Soccer had the highest response rate (43) and of the sports that had responses, Cheerleading had the lowest response rate (1). No one reported having played Hockey.

Table 3. Frequency Table of Sports of Participants

Sport	Frequency	Percentage
Baseball	10	5
Basketball	10	5
Cheerleading	1	0.5
Cross Country	9	4.5
Field Hockey	15	7.5
Football	33	16.5
Golf	6	3
Hockey	0	0
Lacrosse	12	6
Soccer	43	21.5
Softball	10	5
Swimming	12	6
Tennis	4	2
Track and Field	19	9.5
Volleyball	12	6

Water Polo	2	1
Wrestling	2	1

Table 4 reports the findings of age. Participants were asked to report how old they were. With the assumption that the one participant who reported being 25 or older is 25, the mean score was 19.9 (± 1.30). Participants reporting their age as 19 had the highest response rate (56) and participants reporting their age at 23 or 25 had the lowest response rate (1). There were no participants who were 24 years of age.

Table 4. Frequency Table of Age of Participants

Age	Frequency	Percentage
18	27	13.5
19	56	28
20	50	25
21	41	20.5
22	24	12
23	1	.5
24	0	0
25+	1	.5

Hypothesis Testing

The level of significance used for testing all hypotheses was set at .05.

Hypothesis 1: There will be a difference in knowledge about alcohol's effect on performance scores when comparing males and females.

An independent t-Test was used to determine if there was a difference in total scores on the Knowledge About Alcohol Questionnaire between males and females. The results of the analysis are presented below in Table 5.

Table 5. T-test between Gender and Total Score on Knowledge about Alcohol Questionnaire

Gender	N	Mean	Standard Deviation	Std Error Mean	t	Sig
Male	88	17.69	1.783	.190	.334	.692
Female	112	17.61	1.832	.173	.335	

Results: An independent t-Test was calculated comparing the mean knowledge score of male participants and the mean knowledge score of female participants. No significant difference was found ($t(198) = .334, p > .05$).

Conclusion: The mean knowledge scores of the males ($m = 17.69, sd = 1.783$) was not significantly different from the mean knowledge scores of the females ($m = 17.61, sd =$

1.832). There was no difference in knowledge about alcohol by gender.

Hypothesis 2: There will be a difference between the scores on Knowledge about Alcohol Questionnaire in members of individual sports teams and members of team sports teams.

An independent t-Test was used to determine if there was a difference in total scores on the Knowledge about Alcohol Questionnaire between members of individual sports teams or team sports teams. The results of the analysis are presented below in Table 6.

Table 6. T-test between type of sports team and Total Score on Knowledge about Alcohol Questionnaire

Type	N	Mean	Standard Deviation	Std Error Mean	t	Sig
Ind	51	17.51	1.804	.253	-.618	.603
Team	149	17.69	1.812	.148		

Results: An independent t-Test was calculated comparing the mean knowledge score of members of individual sports teams and the mean knowledge score of members of team sports team. No significant difference was found ($t(198) = -.618, p > .05$).

Conclusion: The mean knowledge scores of the members of individual sports teams ($m = 17.51, sd = 1.804$) was not

significantly different from the mean knowledge scores of the members of team sports teams ($m = 17.69, sd = 1.812$). There was no difference in alcohol knowledge based on the sport type.

Hypothesis 3: Knowledge About Alcohol scores will vary significantly based on how frequently the participant consumes alcohol.

A one way ANOVA was used to compare the mean knowledge scores between participants, who drink a few times a year, participants who drink a few times a month, participant who drink once a week, and participants who drink three or more times a week. The results of the analysis are presented below in Table 7.

Table 7. One-way ANOVA between Total Score on Knowledge about Alcohol Questionnaire and Frequency of Alcohol Consumption

Variables	Sum of Squares	df	Mean Square	F	Sig
Between Groups	4.568	3	1.523	.463	.709
Within Groups	645.227	92	3.292		
Total	649.795	98			

Results: A one-way ANOVA was used to compare mean knowledge scores between groups of people with varying alcohol consumption frequency. No significant difference

was found ($F(3, 196) = .463, p > .05$). The mean knowledge scores can be found in Table 8.

Conclusion: Drinking habits had no effect on alcohol knowledge.

Table 8. Mean Scores for Frequency of Alcohol Consumption Groups

Frequency of Alcohol consumption	Mean Knowledge Score	Std Deviation
Few times a year	17.63	1.496
Few times a month	17.79	1.942
Once a week	17.59	1.829
3 or more times a week	17.29	1.848

Additional Findings

Several tests were conducted using the demographic part of the questionnaire along with the total scores on Knowledge about Alcohol Questionnaire in an attempt to discover additional findings.

An independent t-Test was used to determine if there was a difference in total scores on the Knowledge about Alcohol Questionnaire between members of the NCAA Division II school and members of the NCAA Division III schools. The results of this test are represented below in Table 9.

Table 9. Independent t-Test Between NCAA Divisions and Total Score on Knowledge about Alcohol Questionnaire

Division	N	Mean	Standard Deviation	Std Error Mean	t	Sig
II	45	17.36	1.694	.253	-1.222	.614
III	155	17.73	1.835	.147		

Results: An independent t-Test was used to compare the mean knowledge scores of members of NCAA Division II teams and members of NCAA Division III teams. No significant difference was found ($t(198) = -1.222, p > .05$).

Conclusion: The mean knowledge scores of student athletes at the NCAA Division II school ($m = 17.36, sd = 1.694$) was not significantly different than the mean knowledge score of student athletes at the NCAA Division III schools. This shows that athletes from both NCAA Divisions included in this study have the same understanding of how alcohol consumption can effect athletic performance.

Another independent t-Test was used to determine if there was a difference in total scores on the Knowledge about Alcohol Questionnaire between participants that reported they have never practiced or competed with a hangover and those who reported they have practiced or competed with a hangover. The results of this test are represented below in Table 10.

Table 10. Independent t-Test Between Student Athlete's Hangover Practice and Game Status and Total Score on Knowledge about Alcohol Questionnaire

Hangover Status	N	Mean	Standard Deviation	Std Error Mean	t	Sig
Never	158	17.76	1.732	.138	1.747	.274
Have	42	17.21	2.031	.313		

Results: An independent t-Test was used to compare the mean knowledge scores of participants who reported they have never practiced or competed with a hangover and the mean knowledge scores of participants who reported they have practiced or competed with a hangover. No significant difference was found ($t(198) = 1.747, p > .05$).

Conclusion: The mean knowledge scores of participants who reported they have never practiced or competed with a hangover ($m = 17.76, sd = 1.732$) and the mean knowledge scores of participants who reported they have practiced or competed with a hangover ($m = 17.21, sd = 2.031$) were not significantly different. The results of this study show that both athletes who do not practice or compete with a hangover and athletes who do have similar understandings of how alcohol consumption can effect athletic performance.

Another independent t-Test was used to determine if there was a difference in total scores on the Knowledge about Alcohol Questionnaire between participants who reported being under the age of 21 (the legal drinking age)

and participant who reported being over the age over 21.

The results of this test are reported below in Table 11.

Table 11. Independent t-Test between Age and Total Score on Knowledge about Alcohol Questionnaire

Age	N	Mean	Standard Deviation	Std Error Mean	t	Sig
Under 21	133	17.66	1.779	.154	.183	.963
Over 21	67	17.61	1.875	.229		

Results: An independent t-Test was used to compare the mean knowledge scores of participants who reported being under the age of 21 and the mean knowledge scores of participants who reported being over the age of 21. No significant difference was found ($t(198) = .183, p > .05$).

Conclusions: The mean knowledge scores of participants under the age of 21 ($m = 17.66, sd = 1.779$) was not significantly different than the mean knowledge scores of participants over the age of 21 ($m = 17.61, sd = 1.875$). The results of this test show that athletes under the legal drinking age, as well as athletes who are over the legal drinking age, have similar understandings of the effects alcohol consumption can have on the body.

Furthermore, the number of participants in this study who were under the age of 21 more than doubled the number of participants who were over the age of 21. In the Drinking Habits section of the Knowledge about Alcohol

Questionnaire, a question asking "How often do you drink alcohol?" was asked and there were no participants in this study that answered "Never". The following figures illustrate the drinking habits of underage student athletes as compared to student athletes who are of legal drinking age.

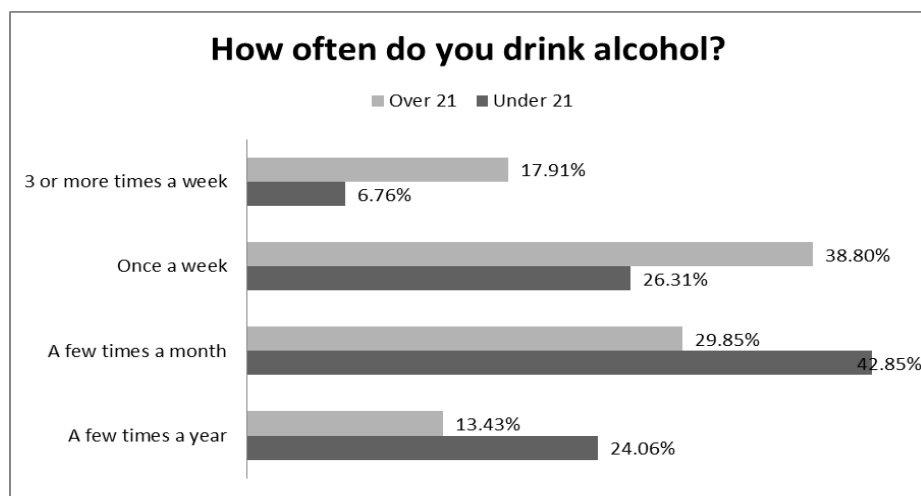


Figure 1. Drinking Habits Question 1

Figure 1 describes the frequency of alcohol consumption between participants under the age of 21 and participants over the age over 21.

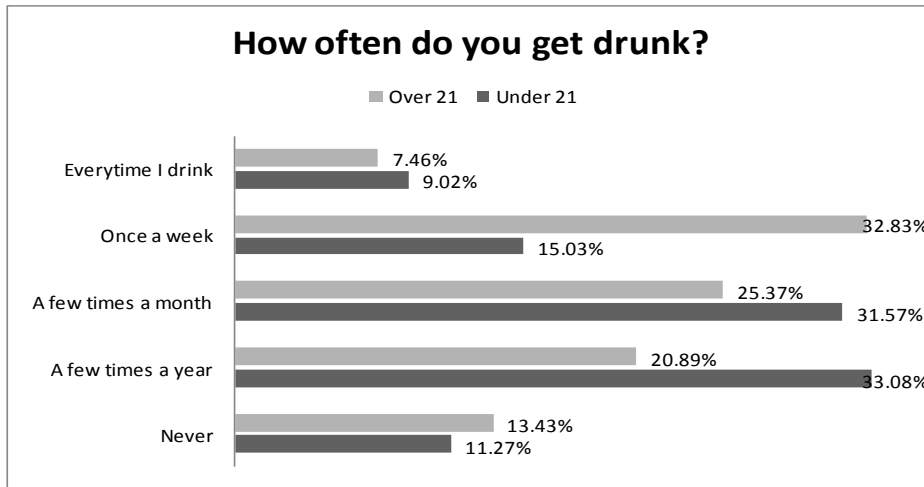


Figure 2. Drinking Habits Question 3

Figure 2 describes the how often participants under the age of 21 and participants over the age over 21 report getting drunk.

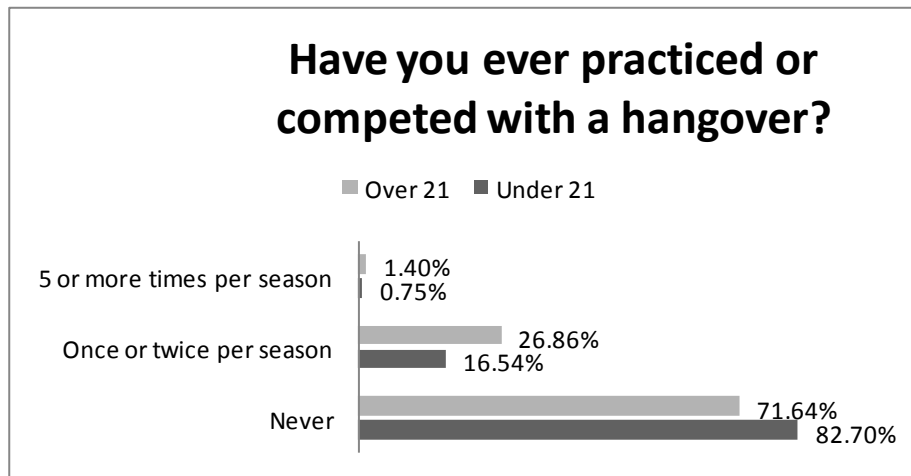


Figure 3. Drinking Habits Question 5

Figure 3 illustrates how often the participants who are under the age of 21 and the participants who are over the age of 21 practice or compete in athletic competition with a hangover.

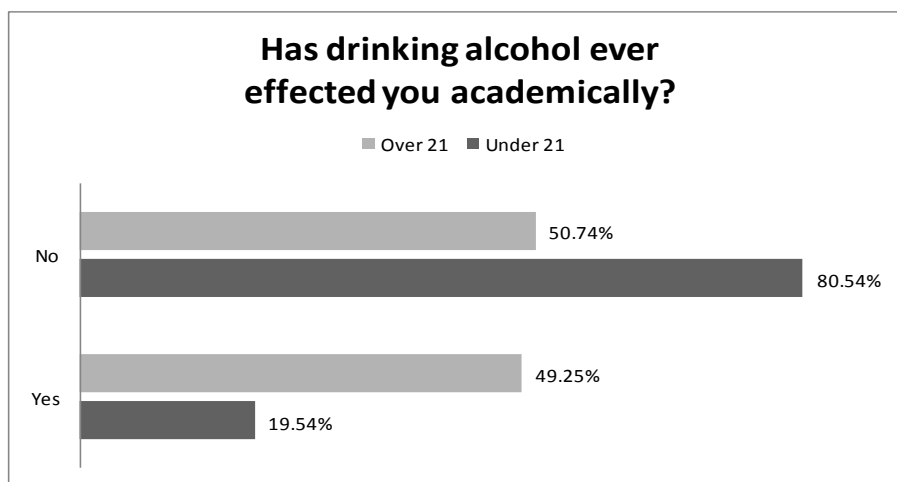


Figure 4. Drinking Habits Question 6

Figure 4 illustrates if participants who are under the age of 21 and if participants who are over the age of 21 have ever had their academic roles or status be effected by their alcohol consumption. This included, but was not limited, to going to class hung-over, missing class because of hangover, or forgetting to study for an exam because of a party.

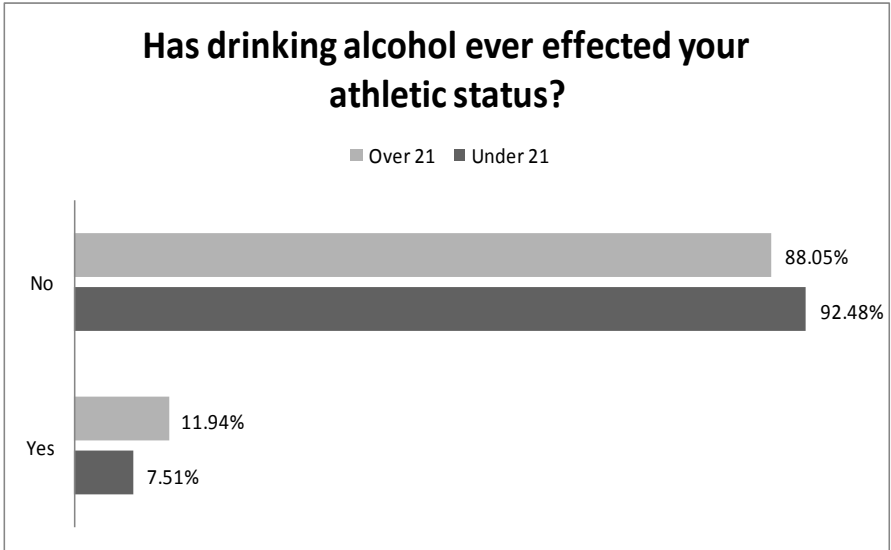


Figure 5. Drinking Habits Question 7

Figure 5 illustrates if participants who are under the age of 21 and if participants who are over the age of 21 have ever had their athletic status be effected by their alcohol consumption. This included, but was not limited to, going to being suspended from a game for getting an alcohol citation or missing a practice or game because of a hangover.

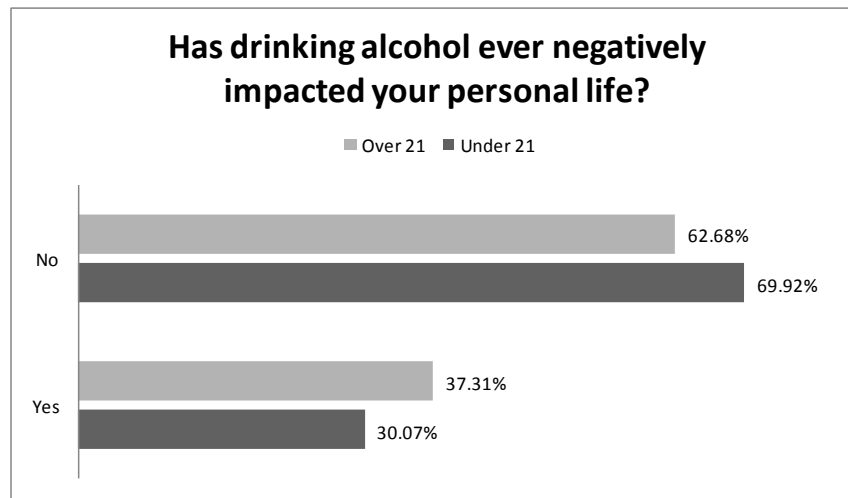


Figure 6. Drinking Habits Question 8

Figure 6 illustrates if participants who are under the age of 21 and if participants who are over the age of 21 have ever had their personal life impacted by alcohol consumption.

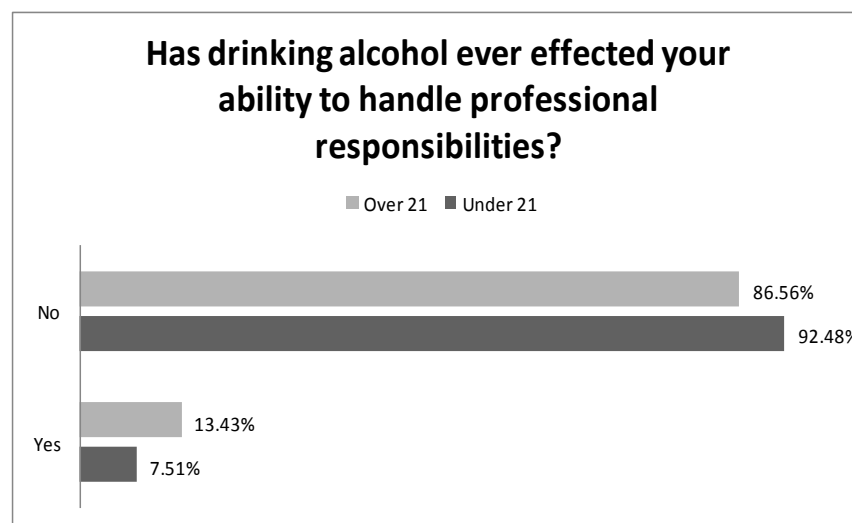


Figure 7. Drinking Habits Question 9

Figure 7 illustrates if participants who are under the age of 21 and if participants who are over the age of 21 have ever had alcohol effect their ability to handle their professional responsibilities. This included, but was not limited to, being unable to go to work because of a hangover or going to work late because of a hangover.

DISCUSSION

Discussion of Results

This survey studied the amount of knowledge collegiate athletes have on how alcohol consumption can affect their athletic performances. The researcher examined specific discriminators such as gender, sport team type, frequency of alcohol consumption, etc can affect the amount of knowledge a student athlete has on the subject matter.

Hypothesis 1 stated there will be a difference in knowledge about alcohol's effect on performance scores when comparing males and females. The researcher proposed that males and females will have different levels of understanding the ways alcohol consumption can affect athletic performance. This idea was based on previous research that associated males with higher drinking incidence than females.^{2,10-13}

The results showed no significant difference between the two groups. The mean scores of both the males and females were statistically the same. Bulmer et al studied alcohol consumption patterns and trends at a public university over a span of 6 years. When comparing data between genders, Bulmer et al found no significant

increases in rate of consumption and frequency of consumption in the male population but very significant increases in the female population. When the Bulmer study began men showed consistently higher rates of alcohol consumption, but over the period of the study the females began bridging the gap in alcohol consumption frequency and volume between males and females.¹³

Hypothesis 2 stated there will be a difference between the scores on Knowledge about Alcohol Questionnaire in members of individual sports teams and members of team sports teams. The researcher proposition this claim based on research suggesting that athletic teams commonly participate in off-the-field social activities that often involve alcohol as a way to promote team unity.¹⁴ No significant difference was found in the mean scores of individuals who participated in individual sports teams and individuals who participated in team sports teams.

The sports teams that were considered individual sports teams in this study included track and field, cross country, golf, swimming, tennis, and wrestling. In some of these sports, there is a team score in competition but it is based off of individual performance, thus possibly leading to a decreased need for team unity. Participating in athletics already puts an individual in a high risk

population for problem drinking.^{2-4,10,11} Individuals who participate in team sports are at an even higher risk because their sports depend on group cohesion. Zamboanga et al discovered that there was high team social cohesion in teams with increased frequency of team social events that involved alcohol.¹⁴

Hypothesis 3 stated that Knowledge about Alcohol scores will vary significantly based on how frequently the participant consumes alcohol. This declaration was based on the assumption that if athletes understood how alcohol impacts athletic performance, they would consume alcohol less. Thomas et al claimed that understanding the perceived negative effects athletes associate with illicit "recreational" drug use may assist in the development of appropriate drug education messages that may prove to be successful in deterring use among high-level athletes.¹⁵ However, no significant difference was found when comparing the mean scores of those who drank alcohol more frequently with those who drank alcohol less frequently.

In 2000, Wechsler et al found that only 59% of colleges with athletic programs provide their athletes with alcohol education programs.¹⁶ But in 2002 Wechsler et al surveyed 474 colleges and found that 84% reported they provided alcohol education to freshman.¹⁷ It is clear, that

education alone is not enough to prevent athletes from becoming part of the problem drinking norm associated with athletics.

Thadani et al examined on the success rates of multi-component prevention programs in the decrease of drinking. According to their research education only programs do not reduce drinking, and in fact, they have been found to produce little measurable change in drinking behaviors. The control group in the study was provided with just educational programming and at the end of the study there was a positive correlation between alcohol knowledge and drinking (those who drank more also had more knowledge about alcohol).¹⁸

In addition to hypothesis testing, some other statistics were performed using other information from the Demographic section and the Drinking Habits section of the Knowledge about Alcohol Questionnaire. The first additional find examined the mean knowledge scores of the two NCAA Divisions that were represented in the study. Green et al found that 76% of Division I colleges provide alcohol education programs while only 50% of Division II schools and 41% of Division III programs provide alcohol education programs.¹⁹ There was no significant difference in the mean scores of student athletes from the NCAA Division II

institution and student athletes from the NCAA Division III institutions.

The second additional finding examined the mean knowledge scores of people who reported they have practiced or competed with a hangover and people who reported they have never practiced or competed with a hangover. There was no significant difference between the mean scores of these two groups. The findings from this statistic determined that people who choose to consume copious amounts of alcohol that would result in a hangover understand the physiological effects of alcohol and how it affects their athletic performance.

The last additional statistic examined the mean knowledge scores of participants who were under the age of 21 and participants who were over the age of 21. There was no significant difference between the two sets of mean knowledge scores. There was however, a profound discrepancy in the number of subjects from each category. The number of participants who were under the legal drinking age of 21, more than doubled the number of participants who were over the legal drinking age. According to the 2008 Monitoring the Future Survey almost 72% of high school seniors reported consuming alcohol during the lifetime, 43% reported consuming alcohol in the past 30 days, 28%

reported being drunk in the last 30 days, and 25% reported binge drinking in the past 2 weeks.²⁰

Conclusions

The results of the study revealed the following major conclusions:

1. Both male and female student athletes had similar amounts of alcohol knowledge.
2. Members of individual sports teams and members of team sports team had similar amounts of alcohol knowledge.
3. People who consume alcohol more frequently have similar amounts of knowledge as people who consume alcohol less frequently.
4. Members of NCAA Division II athletic programs have similar amounts of alcohol knowledge as members of NCAA Division II athletic programs.
5. The amount of knowledge a student athlete has does not affect drinking habits preceding practice or games.
6. People under the age of 21 have similar alcohol knowledge scores as people over the age of 21.
7. People under the age of 21 have similar drinking habits as people over the age of 21.

Recommendations

Based on the results of this study, the following research recommendations were made.

1. Future studies should include a larger sample size.
2. Future studies should include representation of all NCAA Divisions.
3. Future studies may want to consider a using a different instrument that can yield more specific alcohol knowledge data.
4. More studies should be done to understand the reasons why athletes consume more alcohol than do non-athletes.
5. More studies should be done to understand what type of intervention programming would be effective in lowering the alcohol consumption rate and frequency of student athletes.

Policy Recommendations

Because the amount of knowledge student athletes have on how alcohol consumption can effect athletic performance

was not the problem, the following recommendations were made.

1. Regulations need to be put in place to begin regulating alcohol, a mostly unregulated drug.
2. Programming that goes beyond the scope of educating athletes on the effects of alcohol needs to be implemented into athletic programs.

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APPENDICES

APPENDIX A
Review of Literature

REVIEW OF LITERATURE

The purpose of this Review of Literature is to discuss the relationship between alcohol knowledge and use among intercollegiate athletes. There are many studies done surrounding the topic of alcohol and athletes but this literature review will look into a few specifically. A study done by Zamboanga et al¹ examined the role alcohol plays to facilitate social activities among athletes in the way of drinking games. A study done by Doumas et al examined whether there is a relationship between alcohol consumption rates in season or out of season.² Alcohol has always been synonymous with the sportsman's world and continues to be the most commonly used substance among athletes¹; however, this review will examine the role of alcohol as it relates to collegiate athletes.

The topics discussed in this review are alcohol's role as a social facilitator, athletes' drinking habits, the effects alcohol has on athletic performance, common risk factors associated with alcohol, and athletes' knowledge about alcohol's effects on athletic performance.

Athletes vs. Non-athletes

There has always been a strong societal connection between sports and alcohol. It is not uncommon for a sports fan to consume alcohol while celebrating a win or while watching or attending sporting events. There is a long history of sponsorship of athletic clubs by alcohol companies; therefore, the connection between sport and alcohol has deep roots.³ In addition, studies have demonstrated that athletes are more likely to regularly consume alcohol and binge drink in comparison to non-athletes.^{2,4-6} A study by Brenner et al⁵ found that 78% of athletes in a Division I setting, 76% of athletes in a Division II, and 68% of athletes in Division III reported participating in high risk drinking during their non-competitive season. Further, Martin completed a study to determine if drinking rates changed between traditional and non-traditional seasons. He reported that 56% of Division I athletes report binge drinking out of their competitive seasons and 35% report binge drinking during their competitive season.⁷ Alcohol consumption may be statistically lower when athletes are in season, but some still participate in problem drinking.

There is a common belief that participation in athletics would help decrease the number of kids engaging in unhealthy behaviors, such as consuming high quantities of alcohol, but this is not necessarily the case. One study aimed to compare the patterns of alcohol abuse and engagement in organized collegiate sports and found that current and former athletes showed an increase in risky behavior involving alcohol when compared to non-athletes.⁶ Research indicates that athletes and even former athletes are more likely to begin drinking at a younger age, participate in binge drinking more frequently, suffer from high alcohol-related consequences, and are more likely to suffer from alcoholism in the future.⁶

Another study, by J. A. Ford, had similar findings but also speculated on reasons why athletes tend to have higher tendencies to use alcohol. He states that because athletes tend to be in a "peer intensive" state, meaning they usually socialize with their teammates or other athletes in which alcohol consumption is the norm for their group, then other individuals will also feel compelled to partake in activities involving alcohol.⁴ This is only one reason why there may be an increase in alcohol consumption in athletics. In order to fully understand consumption in athletes, it is important to view drinking habits.

Drinking Habits

There are numerous studies arguing that athletes are far more likely to consume alcohol more frequently and have higher consumption rates as compared to non-athletes.^{2,4,5,6} When analyzing alcohol consumption it is important to examine drinking habits. More importantly it is vital to determine whether or not drinking habits change over the course of the academic year or during the in-season or off-season. Further, it is warranted to study whether male or female athletes participate in binge drinking more often. Factors including the awareness of the cultural connection between athletics and drinking alcohol, increased peer pressure and personality factors are just some of the reasons that have been speculated as possible reasons for the heightened alcohol statistics among athletes.⁸ Also, some literature discusses team member's perceptions of their teammate's drinking habits and how these perceptions determine alcohol consumption among athletes. Student athletes have multiple role demands and higher standards that are expected of them by professors, coaches, teammates, and friends.² Maintaining a social life along with balancing schoolwork and team responsibilities can

place stress upon the student athlete which may lead them to consume alcohol. Leichter et al mentions that team leaders and team members with more stress, report higher levels of binge drinking as compared to other team members.⁹ The increase in stress associated with being a team leader or a student athlete could lead the student to team social functions often involving alcohol. J. A. Ford states, "Failure to conform to group norms, by not using alcohol, may result in rejection by peers and social isolation".⁴

One researcher, Berkowitz, examined the social norm theory in an attempt to explain the increased incidence of athletes involved with drinking problems. According to him, this model is built on the assumption that individual behavior can be greatly influenced by peer influence rather than biological, cultural, personal, or family beliefs or influences.¹⁰ In a study done by Lewis he examined whether or not this theory was valid regarding athletes and their consumption of alcohol. The results showed that team leaders who were not binge drinkers perceived more strictness on the subject from coaches and team leaders who were identified as binge drinkers perceived greater leniency from coaches.¹¹ On the other hand, this study supports the beliefs in that athletes, who perceived their

fellow teammates were drinking, were more likely to consume alcohol and vice versa.¹¹

Another drinking habit that was examined by researchers focused on gender. It has been shown that male athletes are much more likely to consume alcohol, binge drink, and drink more frequently than female athletes.¹² One study conducted by Wilson et al¹² concluded that men drank more frequently than women and male athletes drank more heavily than non-athletic males. The same results were concluded when comparing the quantity of alcohol consumed on each drinking occasion and the amount of times they drank to intoxication.¹² Moreover, it was noted that male athletes in particular were more likely to drink for social reasons, such as to get a high, and to use alcohol to relax.¹²

Martens et al⁸ assessed the differences in in-season and off-season alcohol consumption in athletes. The authors researched a theory in which if an athlete were to recognize the negative effects of alcohol on athletic performance; this awareness would lead to a decrease in the amount of alcohol consumed. They concluded that college athletes were less likely to drink during their competitive season and more likely to drink during their off-season.⁸ One reason for this decrease could be because there is more

time for social activities in the off season. However, another explanation for this increase may be athletes believe alcohol will have no effect on future athletic performances if consumed days or weeks before activity.

Alcohol's Effects on Performance

It has been considered that alcohol in moderation may offer some health benefits.¹³ While most studies on this topic are non-conclusive, Suter et al identify that that health benefits associated with proper nutrition and exercise are well established¹⁴ and the consumption of alcohol can have a number of negative effects, both acute and chronic, on the body. Alcohol causes impairments on psychomotor skills, strength and power, and aerobic fitness.^{3,13-17}

Most individuals binge drink so they can have an immediate effect of alcohol called euphoria. After the immediate sensation of elation, psychomotor skills will soon begin to decrease. Ingesting low amounts of alcohol can alter reaction time, fine motor movements, and hand eye coordination.¹⁴ With a moderate to high amount of alcohol consumption these skills are further impaired along with decreased balance and accuracy, coordination, response

skills, speech impairments, and recognition abilities.^{13,14,16,18} These impairments typically only affect an athlete's performance if alcohol was consumed prior or during activity because most of these are short term effects. However, there are a number of effects that are more long term and have the potential to effect athletic performance post-consumption.

One study in particular showed that alcohol is thought to decrease muscular work capacity therefore resulting in slower running and cycling speeds along with a faster onset of fatigue during high intensity exercises.¹⁴ There is evidence showing moderate amounts of alcohol consumed will decrease grip strength, vertical jump height, and sprint speed.³ Exposure to alcohol will interfere with the release of calcium necessary for proper and efficient muscle contractions.¹⁹ The authors of *The effect of Alcohol on Athletic Performance* identified the fact that even low amounts of alcohol in a person's body can impair glucose synthesis in both the liver and in oxidative skeletal muscle therefore, would decrease an athlete's performance during prolonged moderate-intensity activities.¹⁷

Dehydration is thought to be a large contributor to the hangover effect after alcohol consumption.¹⁷ During this phase of recovery there are disturbances in cardiovascular

function including an increased resting heart rate, increased blood pressure, and decreased left ventricular performance.¹⁷ Because alcohol has a diuretic affect it will cause dehydration which in turn will impair aerobic function during exercise.²⁰ This effect will also slow the recovery process after exercise as well.

Some of the chronic effects are associated with long term alcohol use include cellular changes in the liver, heart, brain and muscles leading to increased risk for liver disease, heart disease, stroke, and decreased muscular work capacity.^{3,13,14} An article discussing the health implications associated with alcohol discussed specifically the increased risk of developing breast cancer in women who consistently drink heavily and the increased risk for men to develop colon cancer. This article also mentions how alcohol can reduce the oxidation of fat and enhance the consumer's appetite and therefore, it can lead to increased fat storage²¹ which could be detrimental to athletes who need to strictly regulate their weight such as wrestlers, gymnasts, boxing, and pole vaulters.

Alcohol use can also impair temperature regulation during athletic activity in adverse weather conditions.²⁰ A study done by Yoda et al, on the effects alcohol can have on a person in a cold environment showed that although

alcohol does not affect core temperature, it does have a direct effect on the central nervous system thus decreasing a person's perception of cold.²² This substantial decrease in cold perception greatly increases an athlete's chances of developing hypothermia when participating in activities in a cold environment.

Injuries often occur when participating in intercollegiate sports and studies show that the risk of injury increases when an athlete has consumed alcohol^{3,15} and recovery from injury can be impaired due to alcohol.²³ In addition, researchers believe that even one episode of moderate to heavy alcohol consumption can lead to impairment in immune responses including inflammatory cell function. Also, the same article by Szabo et al discussed other deficiencies in host defense and immune responses that could lead to increased incidence of infections and prolonged recovery from burns, traumatic injury, and infections.²⁴ This would include increasing recovery time for athletic injuries. A study done by Vargas et al, demonstrated that alcohol intake will accelerate atrophic responses in disused muscles and prolong reinitiating weight bearing activities. This was due to the impairments of protein synthesis and degradation.²³ If athletes are unaware of the impact alcohol can have on their body while

it is healing after sustaining an injury or undergoing surgery it will only prolong the healing process and lose more playing time. For these reasons it is demonstrated that acute alcohol intake will increase an athlete's risk for injury but a study done by O'Brien and Lyons describes just how much of an increase to expect. In their study they found that athletes who drank alcohol at least one time per week had an injury rate of 54.8% and the nondrinking population had an injury rate of just 23.5%.²⁰

Athlete's Knowledge of Alcohol's Effects on Performance

There is a need for something more than educational programs teaching athletes the effects alcohol can have within collegiate sports. The National Collegiate Athletic Association has increased their efforts by creating prevention programs in conjunction with the Betty Ford Center.²⁰ Educating athletes will be the corner stone in start to change the fact that alcohol is the most commonly used drug among athletes. K. M. Hildebrand et al, propose colleges requiring a wellness course to be taken by all student athletes and a course like this would address alcoholism and alcohol related issues with the hope to improve behavior management.⁶ But a study by Thadani et al

describes the need for even more. Their study demonstrates that education alone is not enough to change drinking behaviors. The control group in their study received only educational programming and the results at the end of the trial showed participants who drank more also had more knowledge about alcohol. They suggest using multi-component intervention programs that use information about drinking in the context of skills training, normative feedback, and motivational interviewing in a group setting.²⁵ In 2000 Wechsler et al found that only 59% of colleges with athletic programs provide their athletes with alcohol education programs²⁶ and Martin et al found that Division I female athletes averaged between 4 and 8 hours of alcohol education courses during their college careers with a majority of them reporting they wanted more educational programming.⁷ Then, in 2002 Wechsler et al found that out of 747 4-year colleges, 84% provided alcohol education to freshman.²⁷ Although athletes may be receiving the information, and understanding that competing or practicing while intoxicated or hung-over will cause suboptimal performance, they may not fully understand the long term effects heavy alcohol use can have.⁸ Also, the information may be spiking the interest of the student athletes, thus leading to more problematic drinking.²⁵ This is why it is

important for coaches, athletic trainers and sport psychologists to be proactive in helping athletes recognize the impact alcohol can have on their personal and athletic lives⁸ and implementing programs that will be effective in creating positive changes.

Summary

Athletic involvement is clearly a link to increased risk to alcohol related problems. It is important for athletes to be aware that alcohol may impair performance of endurance exercises because of its effects on metabolic, cardiovascular, and thermoregulatory function as well as altering their ability to perform skilled tasks because of its effects on reaction time, fine motor control and judgment and to understand what exactly this means.³ Participating in the consumption of alcohol can promote social interaction within teammates thus leading to better team cohesion¹; however, there are other, healthier, ways for athletes to bond as a team and coaches and team leaders need to be involved in creating healthier lifestyle choices in their team and fellow teammates.

APPENDIX B

The Problem

THE PROBLEM

There is a clear and long standing relationship between sports, exercise, athletes, and alcohol use.²³ Alcohol is now and will continue to be the most commonly consumed drug in the athletic population.²⁰ It very common for athletes to consume alcohol to the point of intoxication more frequently than non-athletes do.¹² Research has even indicated that due to the high amount of alcohol consumed and the greater chance of athletes having drinking related consequences, some researchers even classify athletes as an at risk subpopulation of students.¹¹ With athletes being classified under an at risk category regarding alcohol, do they really know what they are doing to their bodies but consuming large amounts of alcohol? Furthermore, do athletes understand the effect it can have on their performance?

It is important for athletic trainers, coaches, and even athletes to be aware of the negative consequences alcohol can have on athletic performance. But first, they need to understand exactly how much of the information they do not have. The purpose of this study to determine whether or not athletes know about the way alcohol can alter athletic performance.

Definition of Terms

The following definitions of terms will be defined for this study:

- 1) Athlete: A person who participates in NCAA division I, II, or III athletics.
- 2) Binge drinking: Consuming 5 or more drinks in a row for men and 4 or more drinks in a row for women on 1 or more occasions during the past two weeks¹².
- 3) Team Sports: Sports in which 4 or more team members compete towards a common goal (football, baseball, softball, volleyball, soccer, basketball, lacrosse).
- 4) Individual Sports: Sports in which individuals participate rather than groups (cross country, golf, track & field, swimming, tennis).
- 5) Drinking Habits: How often a person drinks and how much alcohol they consume on a regular basis.

Basic Assumptions

The following are basic assumptions of this study:

- 1) The subjects are NCAA Division II and III athletes. No individuals who participate in only intramural or club sports were included in this study.
- 2) All the subjects answered each question honestly and to the best of their knowledge.

- 3) No individual received any assistance from an outside participant or resource to answer a question.

Limitations of the Study

The following are possible limitations of the study:

- 1) The subjects may have received assistance in answering a question or may not have done so honestly.
- 2) A true sampling was not received because only one NCAA Division II program was included and no NCAA Division I programs were.
- 3) Because the internal reliability of the Knowledge about Alcohol Questionnaire was not performed, the reader is cautioned when interpreting the results.

Significance of the Study

Determining whether athletes understand the negative consequences alcohol can have on the body and athletic performance will promote the need for more alcohol education within our athletic programs. If athletes do have a solid understanding of the negative consequences that come from consuming alcohol in regards to athletics, then we will know that there must be another reason for why athletes continue to participate in unhealthy drinking behaviors. If the athletes do not have a clear

understanding, then Athletic Trainers and coaches will need to realize that education is could be the key.

Hopefully, through educating our athletes on how alcohol consumption will affect their performance, athletes will come to realize it's not worth the risk. If this study can prove that our athletes simply do not have enough knowledge on the topic, incorporating more alcohol education seminars into our athletic programs can be one way of educating athletes and start changing the stereotypes having to do with alcohol and athletes. This way, athletes can start focusing more on training to win the competition, rather than training to undo the effects from last night's party.

APPENDIX C

Additional Methods

Appendix C1

Knowledge about Alcohol Questionnaire

Knowledge about Alcohol Questionnaire

1. What is your Gender? Male Female
2. What sport do you play? Football Basketball
 Soccer Lacrosse Track and Field
 Volleyball Swimming Cross Country Tennis
 Wrestling Field Hockey Golf Baseball Softball
3. What School do you attend? California University of
 Pennsylvania Frostburg State University Penn
 State Greater Allegheny Penn State Fayette-
 Eberly Campus Washington and Jefferson College
4. What year in college are you? Freshman Sophomore
 Junior Senior Graduate
5. What is your age?

Drinking Habits

1. What kind of alcohol do you drink? Beer
 Mixed drinks Shots Wine Malt Beverages
2. How often do you drink alcohol? Never A few
 times a year A few times a month Once a week
 3 or more times a week
3. How often do you get drunk? Never A few times a
 year A few times a month Once a week
 Every time I drink
4. Who do you usually drink alcohol with? Teammates
 Other friends By myself
5. Have you ever practiced or competed with a hangover?
 Never Once or twice per season
 more than 5 times in a season
6. Has Drinking alcohol ever effected you academically
 (going to class hung-over, missing class because of a
 hang-over, etc) yes no
7. Has drinking alcohol ever affected you athletically?
 (practicing or competing while intoxicated or hung-
 over, getting a citation and being suspended from the
 team, etc) yes no
8. Has drinking ever negatively impacted your personal
 life? Yes no

9. Has drinking ever affected your professional responsibilities? (could not go into work because of a hang-over, etc) Yes no

Alcohol Knowledge Questions

Please answer each of the following questions to the best of your ability without any outside assistance.

1. Drinking alcohol will increase accuracy
True **False**
2. Drinking alcohol will slow reaction time
True False
3. Drinking alcohol will increase hand-eye coordination
True **False**
4. Drinking alcohol will increase fatigue during exercise
True False
5. Exercise will increase alcohol metabolism
True **False**
6. Alcohol will increase muscular work capacity (i.e. make you run faster and longer) True **False**
7. Drinking alcohol will increase the loss of muscle mass when recovering from an injury **True** False
8. Drinking alcohol will increase your chances of sustaining a sports related injury **True**
False
9. Drinking alcohol will increase your vertical jump height
True **False**
10. Drinking alcohol will help your body recover after exercise True **False**
11. Drinking alcohol will cause an increase in blood pressure **True** False
12. Drinking alcohol will cause you to stay warmer when exercising in the cold True **False**
13. Drinking alcohol will increase muscular power
True **False**
14. Alcohol promotes body fat accumulation
True False
15. Exercise after drinking alcohol can cause an increase in muscle damage **True** False
16. Drinking alcohol will decrease the pumping forces of the heart **True** False
17. Drinking alcohol can negatively impair your immune system **True** False

18. Drinking alcohol within 24 hours of athletic performance will not have an effect aerobic performances True **False**
19. Alcohol will increase your blood sugar levels enabling you to exercise longer True **False**
20. Alcohol will change the body's hormonal balances making it more conducive to increases in muscle mass
True **False**

NOTE: The **Bolded** test marks the correct answer for each knowledge question.

APPENDIX C2

Institutional Review Board -
California University of Pennsylvania



California University of Pennsylvania

Proposal Number
Date Received

PROTOCOL for Research Involving Human Subjects

Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects

(Reference IRB Policies and Procedures for clarification)

<i>Project Title</i> <u>Collegiate Athletes' Knowledge on the Effects of Alcohol Consumption on Athletic Performance</u>
<i>Researcher/Project Director</i> <u>Joanna M. Murray</u>
<i>Phone #</i> <u>301-412-4308</u> <i>E-mail Address</i> <u>mur7552@calu.edu</u>
<i>Faculty Sponsor (if required)</i> <u>Dr. Robert H. Kane</u>
<i>Department</i> <u>Health Science</u>
<i>Project Dates</i> <u>January 2011</u> to <u>January 2012</u>
<i>Sponsoring Agent (if applicable)</i> _____
<i>Project to be Conducted at</i> <u>Survey completed online by students attending California University of Pennsylvania, Frostburg State University, Penn State Greater Allegheny, Penn State Fayette-Elberly Campus, Washington and Jefferson College</u>
<i>Project Purpose:</i> <input checked="" type="checkbox"/> <i>Thesis</i> <input type="checkbox"/> <i>Research</i> <input type="checkbox"/> <i>Class Project</i> <input type="checkbox"/> <i>Other</i>
Keep a copy of this form for your records.

Please attach a typed, detailed summary of your project AND complete items 2 through 6.

1. *Provide an overview of your project-proposal describing what you plan to do and how you will go about doing it. Include any hypothesis(es) or research questions that might be involved and explain how the information you gather will be analyzed. For a complete list of what should be included in your summary, please refer to Appendix B of the IRB Policies and Procedures Manual.*

The primary purpose of this study is to examine the amount of knowledge collegiate athletes have in regards to the effects of alcohol consumption on athletic performance. The subjects that will be used for this study will be athletes from California University of Pennsylvania, Penn State Fayette – Elberly Campus, Penn State Greater Allegheny, Washington and Jefferson College, and Frostburg State University. The questionnaire will be administered via the internet and each athlete will receive instructions through an email sent by the researcher. They will be asked to complete the questionnaire without any outside assistance and submit it. The data collected will be analyzed by way of SPSS 17.0 in order to determine the validity of the hypotheses. There are three hypotheses included in this project. It is hypothesized that there will be a difference in knowledge about alcohol's effect on performance scores when comparing males and females, there will be a difference between the scores on knowledge about alcohol's effects on performance and consumption levels of members of individual sports teams and members of team sports teams, and there will be a negative correlation between the amount of alcohol consumed and the scores on knowledge about alcohol's effect on performance.

2. *Section 46.11 of the Federal Regulations state that research proposals involving human subjects must satisfy certain requirements before the IRB can grant approval. You should describe in detail how the following requirements will be satisfied. Be sure to address each area separately.*
 - a. *How will you insure that any risks to subjects are minimized? If there are potential risks, describe what will be done to minimize these risks. If there are risks, describe why the risks to participants are reasonable in relation to the anticipated benefits.*

There are no foreseeable risks associated with the completion of the survey. No research will be conducted before approval is granted by the IRB. No questions will be asked that would alter the anonymity of the participants.

- b. *How will you insure that the selection of subjects is equitable? Take into account your purpose(s). Be sure you address research problems involving vulnerable populations such as children, prisoners, pregnant women, mentally disabled persons, and economically or educationally disadvantaged persons. If this is an in-class project describe how you will minimize the possibility that students will feel coerced.*

All athletes from team's included in the study will be used. Athlete's emails will be obtained through the athletic director and coaches at California University of Pennsylvania, Frostburg State University, Penn State Greater Allegheny, Penn State Fayette-Eberly campus, and Washington and Jefferson College. Athletes will be excluded if they are under the age of 18.

- c. *How will you obtain informed consent from each participant or the subject's legally authorized representative and ensure that all consent forms are appropriately documented? Be sure to attach a copy of your consent form to the project summary.*

Informed consent will be assumed once the questionnaire is completed and submitted. The athletes can choose to not participate in the study. This is stated in the cover letter sent accompanying the survey.

3

- d. Show that the research plan makes provisions to monitor the data collected to insure the safety of all subjects. This includes the privacy of subjects' responses and provisions for maintaining the security and confidentiality of the data.

The athlete's name and email will not be attached to the answers as to keep the survey anonymous. The information will be kept confidential and only the researcher and the advisor will have access to it. All the electronic data will be kept in a password secured location.

3. Check the appropriate box(es) that describe the subjects you plan to use.

<input checked="" type="checkbox"/> Adult volunteers	<input type="checkbox"/> Mentally Disabled People
<input checked="" type="checkbox"/> CAL University Students	<input type="checkbox"/> Economically Disadvantaged People
<input checked="" type="checkbox"/> Other Students	<input type="checkbox"/> Educationally Disadvantaged People
<input type="checkbox"/> Prisoners	<input type="checkbox"/> Fetuses or fetal material
<input type="checkbox"/> Pregnant Women	<input type="checkbox"/> Children Under 18
<input type="checkbox"/> Physically Handicapped People	<input type="checkbox"/> Neonates

4. Is remuneration involved in your project? Yes or No. If yes, Explain here.
5. Is this project part of a grant? Yes or No. If yes, provide the following information:
 Title of the Grant Proposal _____
 Name of the Funding Agency _____
 Dates of the Project Period _____
6. Does your project involve the debriefing of those who participated? Yes or No
 If Yes, explain the debriefing process here.
7. If your project involves a questionnaire interview, ensure that it meets the requirements of Appendix ___ in the Policies and Procedures Manual.

California University of Pennsylvania Institutional Review Board
Survey/Interview/Questionnaire Consent Checklist (v021209)

This form **MUST** accompany all IRB review requests

Does your research involve **ONLY** a survey, interview or questionnaire?

YES—Complete this form

NO—You **MUST** complete the “Informed Consent Checklist”—skip the remainder of this form

Does your survey/interview/questionnaire cover letter or explanatory statement include:

- (1) Statement about the general nature of the survey and how the data will be used?
- (2) Statement as to who the primary researcher is, including name, phone, and email address?
- (3) FOR ALL STUDENTS: Is the faculty advisor’s name and contact information provided?
- (4) Statement that participation is voluntary?
- (5) Statement that participation may be discontinued at any time without penalty and all data discarded?
- (6) Statement that the results are confidential?
- (7) Statement that results are anonymous?
- (8) Statement as to level of risk anticipated or that minimal risk is anticipated? (NOTE: If more than minimal risk is anticipated, a full consent form is required—and the Informed Consent Checklist must be completed)
- (9) Statement that returning the survey is an indication of consent to use the data?
- (10) Who to contact regarding the project and how to contact this person?
- (11) Statement as to where the results will be housed and how maintained? (unless otherwise approved by the IRB, must be a secure location on University premises)
- (12) Is there text equivalent to: “Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective nn/nn/nn and expires mm/mm/mm”? (the actual dates will be specified in the approval notice from the IRB)?
- (13) FOR ELECTRONIC/WEBSITE SURVEYS: Does the text of the cover letter or explanatory statement appear before any data is requested from the participant?
- (14) FOR ELECTONIC/WEBSITE SURVEYS: Can the participant discontinue participation at any point in the process and all data is immediately discarded?

**California University of Pennsylvania Institutional Review Board
Informed Consent Checklist (v021209)**

This form **MUST** accompany all IRB review requests

Does your research involve **ONLY** a survey, interview, or questionnaire?

YES—DO NOT complete this form. You **MUST** complete the “Survey/Interview/Questionnaire Consent Checklist” instead.

NO—Complete the remainder of this form.

1. Introduction (check each)

- (1.1) Is there a statement that the study involves research?
 (1.2) Is there an explanation of the purpose of the research?

2. Is the participant. (check each)

- (2.1) Given an invitation to participate?
 (2.2) Told why he/she was selected.
 (2.3) Told the expected duration of the participation.
 (2.4) Informed that participation is voluntary?
 (2.5) Informed that all records are confidential?
 (2.6) Told that he/she may withdraw from the research at any time without penalty or loss of benefits?
 (2.7) 18 years of age or older? (if not, see Section #9, Special Considerations below)

3. Procedures (check each).

- (3.1) Are the procedures identified and explained?
 (3.2) Are the procedures that are being investigated clearly identified?
 (3.3) Are treatment conditions identified?

4. Risks and discomforts. (check each)

- (4.1) Are foreseeable risks or discomforts identified?
 (4.2) Is the likelihood of any risks or discomforts identified?
 (4.3) Is there a description of the steps that will be taken to minimize any risks or discomforts?
 (4.4) Is there an acknowledgement of potentially unforeseeable risks?
 (4.5) Is the participant informed about what treatment or follow up courses of action are available should there be some physical, emotional, or psychological harm?
 (4.6) Is there a description of the benefits, if any, to the participant or to others that may be reasonably expected from the research and an estimate of the likelihood of these benefits?
 (4.7) Is there a disclosure of any appropriate alternative procedures or courses of treatment that might be advantageous to the participant?

5. Records and documentation. (check each)

- (5.1) Is there a statement describing how records will be kept confidential?
 (5.2) Is there a statement as to where the records will be kept and that this is a secure location?
 (5.3) Is there a statement as to who will have access to the records?

6. For research involving more than minimal risk (check each),

- (6.1) Is there an explanation and description of any compensation and other medical or counseling treatments that are available if the participants are injured through participation?
- (6.2) Is there a statement where further information can be obtained regarding the treatments?
- (6.3) Is there information regarding who to contact in the event of research-related injury?

7. Contacts (check each)

- (7.1) Is the participant given a list of contacts for answers to questions about the research and the participant's rights?
- (7.2) Is the principal researcher identified with name and phone number and email address?
- (7.3) FOR ALL STUDENTS: Is the faculty advisor's name and contact information provided?

8. General Considerations (check each)

- (8.1) Is there a statement indicating that the participant is making a decision whether or not to participate, and that his/her signature indicates that he/she has decided to participate having read and discussed the information in the informed consent?
- (8.2) Are all technical terms fully explained to the participant?
- (8.3) Is the informed consent written at a level that the participant can understand?
- (8.4) Is there text equivalent to: "Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective mm/mm/nn and expires mm/mm/mm" (the actual dates will be specified in the approval notice from the IRB)

9. Specific Considerations (check as appropriate)

- (9.1) If the participant is or may become pregnant is there a statement that the particular treatment or procedure may involve risks, foreseeable or currently unforeseeable, to the participant or to the embryo or fetus?
- (9.2) Is there a statement specifying the circumstances in which the participation may be terminated by the investigator without the participant's consent?
- (9.3) Are any costs to the participant clearly spelled out?
- (9.4) If the participant desires to withdraw from the research, are procedures for orderly termination spelled out?
- (9.5) Is there a statement that the Principal Investigator will inform the participant or any significant new findings developed during the research that may affect them and influence their willingness to continue participation?
- (9.6) Is the participant is less than 18 years of age? If so, a parent or guardian must sign the consent form and assent must be obtained from the child
 - Is the consent form written in such a manner that it is clear that the parent/guardian is giving permission for their child to participate?
 - Is a child assent form being used?
 - Does the assent form (if used) clearly indicate that the child can freely refuse to participate or discontinue participation at any time without penalty or coercion?
- (9.7) Are all consent and assent forms written at a level that the intended participant can understand? (generally, 8th grade level for adults, age-appropriate for children)

California University of Pennsylvania Institutional Review Board
Review Request Checklist (v021209)

This form **MUST** accompany all IRB review requests.
 Unless otherwise specified, **ALL** items must be present in your review request.

Have you:

(1.0) FOR ALL STUDIES: Completed ALL items on the Review Request Form?

Pay particular attention to:

- (1.1) Names and email addresses of all investigators
 - (1.1.1) FOR ALL STUDENTS: use only your CalU email address)
 - (1.1.2) FOR ALL STUDENTS: Name and email address of your faculty research advisor
- (1.2) Project dates (must be in the future—no studies will be approved which have already begun or scheduled to begin before final IRB approval—NO EXCEPTIONS)
- (1.3) Answered completely and in detail, the questions in items 2a through 2d?
 - 2a: NOTE: No studies can have zero risk, the lowest risk is “minimal risk”. If more than minimal risk is involved you **MUST**:
 - i. Delineate all anticipated risks in detail;
 - ii. Explain in detail how these risks will be minimized;
 - iii. Detail the procedures for dealing with adverse outcomes due to these risks.
 - iv. Cite peer reviewed references in support of your explanation.
 - 2b. Complete all items.
 - 2c. Describe informed consent procedures in detail.
 - 2d. NOTE: to maintain security and confidentiality of data, all study records must be housed in a secure (locked) location ON UNIVERSITY PREMISES. The actual location (department, office, etc.) must be specified in your explanation and be listed on any consent forms or cover letters.
- (1.4) Checked all appropriate boxes in Section 3? If participants under the age of 18 years are to be included (regardless of what the study involves) you **MUST**:
 - (1.4.1) Obtain informed consent from the parent or guardian—consent forms must be written so that it is clear that the parent/guardian is giving permission for their child to participate.
 - (1.4.2) Document how you will obtain assent from the child—This must be done in an age-appropriate manner. Regardless of whether the parent/guardian has given permission, a child is completely free to refuse to participate, so the investigator must document how the child indicated agreement to participate (“assent”).
- (1.5) Included all grant information in section 5?
- (1.6) Included ALL signatures?

(2.0) FOR STUDIES INVOLVING MORE THAN JUST SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:

- (2.1) Attached a copy of all consent form(s)?
- (2.2) FOR STUDIES INVOLVING INDIVIDUALS LESS THAN 18 YEARS OF AGE: attached a copy of all assent forms (if such a form is used)?
- (2.3) Completed and attached a copy of the Consent Form Checklist? (as appropriate—see that checklist for instructions)

- (3.0) FOR STUDIES INVOLVING ONLY SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:
- (3.1) Attached a copy of the cover letter/information sheet?
 - (3.2) Completed and attached a copy of the Survey/Interview/Questionnaire Consent Checklist? (see that checklist for instructions)
 - (3.3) Attached a copy of the actual survey, interview, or questionnaire questions in their final form?
- (4.0) FOR ALL STUDENTS: Has your faculty research advisor:
- (4.1) Thoroughly reviewed and approved your study?
 - (4.2) Thoroughly reviewed and approved your IRB paperwork? including:
 - (4.2.1) Review request form,
 - (4.2.2) All consent forms, (if used)
 - (4.2.3) All assent forms (if used)
 - (4.2.4) All Survey/Interview/Questionnaire cover letters (if used)
 - (4.2.5) All checklists
 - (4.3) IMPORTANT NOTE: Your advisor's signature on the review request form indicates that they have thoroughly reviewed your proposal and verified that it meets all IRB and University requirements.
- (5.0) Have you retained a copy of all submitted documentation for your records?

Project Director's Certification
Program Involving HUMAN SUBJECTS

The proposed investigation involves the use of human subjects and I am submitting the complete application form and project description to the Institutional Review Board for Research Involving Human Subjects.

I understand that Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects. If the Board grants approval of this application, I agree to:

1. Abide by any conditions or changes in the project required by the Board.
2. Report to the Board any change in the research plan that affects the method of using human subjects before such change is instituted.
3. Report to the Board any problems that arise in connection with the use of human subjects.
4. Seek advice of the Board whenever I believe such advice is necessary or would be helpful.
5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board in its effort to provide a continuing review after investigations have been initiated.

I have reviewed the Federal and State regulations concerning the use of human subjects in research and training programs and the guidelines. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application. I understand that changes to the research must be approved by the IRB before they are implemented.

Professional Research

Project Director's Signature

Department Chairperson's Signature

Student or Class Research

Student Researcher's Signature

Supervising Faculty Member's Signature if required

For Robert Kane

Department Chairperson's Signature

ACTION OF REVIEW BOARD (IRB use only)

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

1. provides adequate safeguards of the rights and welfare of human subjects involved in the investigations;
2. uses appropriate methods to obtain informed, written consent;
3. indicates that the potential benefits of the investigation substantially outweigh the risk involved.
4. provides adequate debriefing of human participants.
5. provides adequate follow-up services to participants who may have incurred physical, mental, or emotional harm.

Approved [_____]

Disapproved

Chairperson, Institutional Review Board

Date

IRB 10-026 approval

instreviewboard

Actions

To:

M

MUR7552 - MURRAY, JOANNA MARIE

Cc:

M

Skwarecki, Robert; Kane, Robert

Thursday, March 03, 2011 2:19 PM

Institutional Review Board
 California University of Pennsylvania
 Psychology Department LRC, Room 310
 250 University Avenue
 California, PA 15419
instreviewboard@cup.edu
instreviewboard@calu.edu
 Robert Skwarecki, Ph.D., CCC-SLP, Chair

Ms. Murray

PI "Collegiate Athletes' Knowledge on the Effects of Alcohol Consumption on Athletic Performance" (Proposal #10-026) has been approved by the California University of Pennsylvania Institutional Review Board as amended.

The effective date of the approval is 03-03-2011 and the expiration date is 03-02-2012. These dates must appear on the consent form.

Please note that Federal Pong any of the following:

- (1) Any additions or changes in procedures you might wish for your study (additions or changes must be approved by the IRB before they are implemented)
- (2) Any events that affect the safety or well-being of subjects
- (3) Any modifications of your study or other responses that are necessitated by any events reported in (2).
- (4) To continue your research beyond the approval expiration date of 03-02-2012 you must file additional information to be considered for continuing review. Please contact instreviewboard@calu.edu

Please notify the Board when data collection is complete.

Regards,

Robert Skwarecki, Ph.D., CCC-SLP
 Chair, Institutional Review Board

APPENDIX C3

Cover Letter



California University of Pennsylvania

March 16, 2011

Dear Student Athlete:

My name is Joanna Murray and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis through conducting research. I am conducting survey research to determine if athletes understand how alcohol consumption can impact their athletic performance.

Athletes from your institution, as well as four others, are being asked to participate; however, your participation is voluntary and you do have the right to choose not to participate. You must be 18 years of age or older in order to participate in this study. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective 03/03/2011 and expires 03/02/2012.

All survey responses are anonymous and will be kept confidential, and informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take no more than 20 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher Joanna Murray at mur7552@calu.edu. You can also contact the faculty advisor for this research Dr. Robert Kane by phone at 724-938-4011 or email at kane@calu.edu. Thanks in advance for your participation. Please click the following link to access the survey: <https://www.surveymonkey.com/s/9HKY52X>.

Thank you for taking the time to take part in my thesis research. I greatly appreciate your time and effort put into this task.

Joanna M. Murray, ATC, PES
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
301-412-4308
Mur7552@calu.edu

APPENDIX C4

Coach Information Letter



California University of Pennsylvania

Date

Dear Coaches,

My name is Joanna Murray and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. I recently contacted (Athletic Director's name) asking for permission to contact (Institution's name) athletes to take part in my research thesis. On March 3, 2011 the California University of Pennsylvania's Institutional Review Board approved my research proposal.

I would like to begin distributing the link to my online questionnaire. All the information your athletes need is in the cover letter I have attached to this email. If you could please copy and paste it into an email to all the members of your team, it would be greatly appreciated.

Please let me know if you need any other information from me. Thank you again for your cooperation.

Sincerely,

Joanna M. Murray, ATC, PES
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
301-412-4308
Mur7552@calu.edu

Robert Kane, EdD, PT, ATC
Research Advisor
California University of Pennsylvania
250 University Ave
California, PA 15419
kane@calu.edu

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ABSTRACT

Title: Collegiate Athletes' Knowledge on the Effects of Alcohol Consumption on Athletic Performance

Researcher: Joanna M. Murray

Advisor: Dr. Robert Kane

Purpose: The primary purpose of this to examine the amount of knowledge collegiate athletes have in regards to the effects of alcohol consumption on athletic performance.

Methods: Participants included 200 student athletes from five collegiate institutions. The Knowledge about Alcohol Questionnaire was distributed electronically to the subjects and completed. The data was analyzed using Independent t-Tests and an ANOVA with an alpha level set at .05.

Findings: Gender had no effect on the amount of knowledge the student athletes had on the subject of alcohol consumption and its effect on athletic performance. Members of individual sports teams and members of team sports team had the same amount of knowledge on the subject of alcohol. Student athletes who consume alcohol more frequently have the same amount of knowledge as student athletes who drink less frequently. There were 133 participants who were under the age of 21 and they all reported having drunk alcohol.

Conclusions: It was determined that gender, type of sports team, and drinking frequency had no effect on knowledge about alcohol knowledge scores.