

STUDENT-ATHLETE ADHERANCE TO THE NATIONAL ATHLETIC
TRAINERS' GUIDELINES ON PREVENTING SKIN DISEASES

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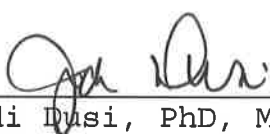
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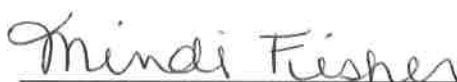
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INTRODUCTION

The National Athletic Trainers' Association (NATA) has published guidelines regarding preventing skin diseases in athletes.¹ These guidelines provide relevant information on ways to recognize, treat, and prevent different types of skin infections. Athletic trainers (ATs) already have the knowledge of how to treat and prevent these types of disorders and know how to recognize when an athlete has a skin infection. Not only is awareness of NATA Guidelines on Preventing Skin Diseases important for health care professionals, but the participating athletes need to be aware of these guidelines as well because dermatological infections have been occurring more frequently in the last several years.¹⁻³

Specifically, infections have mainly been occurring in the sports that require some sort of contact.²⁻³ The equipment that the contact sports require have also been connected to the cause of skin infections occurring.¹⁻³ Although this mainly occurs with contact sports involving protective equipment, skin infections could occur within all sports.¹⁻³ Some causes of skin infections include direct skin-to-skin contact with an individual who already has the

skin infection or unsanitary practices by the individual or in the environment surrounding them.¹ In these cases, the NATA Guidelines on Preventing Skin Diseases may help with preventing the skin diseases from occurring.

This research study looked to determine if student-athletes are adhering to the NATA Guidelines on Preventing Skin Diseases. The subjects of the study include male and female student-athletes involved in collegiate division two or three sports. This includes both contact and non-contact sports. Subjects will be asked to complete a survey pertaining to hygiene practices and skin infection management. During this research study, the results of the survey will help determine if student-athletes are adhering to the NATA Guidelines on Preventing Skin Diseases.

METHODS

The primary aim of this study is to determine if collegiate athletes are adhering to recommended measures identified by the NATA Guidelines on the Prevention of Skin Diseases. This is in terms of exploring the student-athletes' hygiene practices and skin infection management practices while participating in collegiate athletics. The secondary aim of the study is to identify barriers to implementation of the NATA Guidelines on the Prevention of Skin Disease. The secondary aim is included to provide insight if student-athletes are not adhering to the recommended measures established by the NATA. This section includes subsections of: Research Design, Subjects, Instruments, Procedures, Hypothesis, and Data Analysis.

Research Design

This research project is a descriptive study to determine if collegiate athletes are adhering to recommended measures identified by the NATA Guidelines on the Prevention of Skin Diseases. Subjects who are student-athletes were asked to complete the survey titled Hygiene

Practices in Athletes (Appendix C1). This survey consists of items addressing personal hygiene practice and self-management of skin diseases. Survey results were used to classify athletes' adherence with the specific NATA guideline. Thus, adherence is described as the level that the subjects do follow the guidelines that are set by the NATA. Non-adherence rates refer to the subjects that do not follow, or not aware of, these NATA Guidelines for Preventing Skin Diseases. Since this is a descriptive in nature, there were not any independent or dependent variables. In addition to items regarding hygiene and skin care, subjects were also asked questions relating to the barriers that may cause them to not follow the recommended measures identified by the NATA Guidelines on the Prevention of Skin Diseases.

The major limitation of the study design is that subjects may not have completed the survey honestly. Because the surveys relate to the personal nature of hygiene, subjects may have been reluctant to answer honestly. The second limitation is that the subject pool is limited to universities in which the investigator is associated with at some capacity. A strength of the study includes the ability to survey subjects electronically to

allow the subjects to complete the survey anonymously and on their own time to ensure privacy.

Subjects

The subjects of the study include male and female student-athletes, age 18 or older, who are currently active in division two or division three contact or non-contact collegiate sports. The schools that have been selected for this research project, using a sample of convenience, are California University of Pennsylvania, King's College, and Washington and Jefferson College. Each subject was asked to participate in one online survey for completion.

The Hygiene Practices in Athletes survey was sent to the athletic trainers of the selected colleges and universities via email. The athletic trainers then forwarded the email to the student-athletes that will be completed online using Survey Monkey. The survey was sent to 909 student athletes overall. This number of subjects is a total number from the student athletes at each of the three schools involved in this survey: California University of Pennsylvania has 258 student-athletes, King's College has 321 student-athletes, and Washington and

Jefferson College has 330 student-athletes. A cover letter was provided to the subjects at the time of survey distribution to obtain voluntary participation of the subjects and implied consent (Appendix C5). The geographic location of this research study includes colleges and universities in the state of Pennsylvania.

The study was approved by the Institutional Review Boards at California University of Pennsylvania, King's College, and Washington and Jefferson College prior to data collection (Appendix C2-C4). Each participant's identity will remain confidential and was not included in the study. Subjects who are not 18 years or older or are not affiliated with a division two or three sports were excluded from the study.

Preliminary Research/Project Development

For this research study, a survey was composed by the primary researcher that is based off of the NATA Guidelines on Prevention of Skin Diseases (Appendix D). Specifically, the survey was based on items #3 - #7 as these guidelines are applicable to student athletes. Items #1 and #2 refer to organizational support and environmental cleanliness which is not a focus of this study. This survey was

examined by a panel of three athletic trainers with experience in working with collegiate athletes to establish content validity and assure the questions accurately represent NATA Guidelines on Preventing Skin Diseases #3-#7. The athletic trainers have determined that primary researcher's survey does demonstrate content validity for the NATA Guidelines #3-#7.

Preliminary research was also conducted to determine how long this survey would take to complete. A different group of athletic trainers were asked to complete the survey and report how long it took them to finish. This resulted in the survey taking at 5-10 minutes to complete.

Instruments

Subjects completed the Hygiene Practices in Athletes Survey which is a required 30-item survey based on the NATA Guidelines relating to personal hygiene and skin disease management. Although there are 30 questions that are mandatory to answer, there are an additional 13 questions that serve as follow-up questions to certain questions to explore certain aspects of the study. Therefore, overall, it is a 43-item survey. The survey was conducted

electronically, using Survey Monkey®.

The first few items on the survey asked for demographic information from the subject including age, gender, school association (California University of Pennsylvania, King's College, or Washington and Jefferson College), what class year are they considered as in their sport, and athletic team affiliation (soccer, basketball, football, lacrosse, swimming, wrestling, baseball, softball, track and field, other). Such information was used to describe the study sample. The Hygiene Practices in Athletes survey included questions to determine if the athletes are adhering to the NATA Guidelines for Preventing Skin Diseases. The questions of the survey were based on the specific NATA Guidelines #3-#7 (Appendix E).

In addition to the above questions, subjects were also asked about barriers that prevent them from implementing the NATA Guidelines on Prevention of Skin Diseases. Although there is one open-ended question for subjects to complete, there are two items on the survey (#15 and #16) that ask subjects to discuss frequency of clothing and equipment cleaning. Improper cleanliness of clothing and equipment have been shown to increase risk of skin infections¹⁻³ and thus may be considered a barrier to NATA Guideline adherence. Hence, inclusion of these questions

were needed to not only identify barriers but to provide examples to subjects of potential barriers to encourage completion of the open-ended question.

Procedure

The researcher obtained Institutional Review Board (IRB) approval at California University of Pennsylvania, Washington and Jefferson College, and King's College before beginning any data collection or distribution of the survey. The researcher then contacted the athletic trainers at their respective schools to facilitate survey distribution. Each subject was asked via an attached cover letter to participate in the study by completing the online survey, Hygiene Practices in Athletes.

Subjects were assured, via the cover letter that their participation is completely voluntary, that they may remove themselves from participation at any point in the process, and that consent is implied if they chose to complete the survey. The survey was developed using Survey Monkey. All surveys were completed anonymously and each participant's identity remained confidential.

The email to prospective participants included mention of IRB approval and the cover letter outlining voluntary

participation and implied consent. The athletic trainer then emailed the survey a total of two times to every participant over a two-week period. After one week, the athletic trainers were reminded to send out a reminder email to the student-athletes to complete the survey if they haven't already.

Following this two-week period, the survey link was deactivated and submissions were no longer accepted. The survey data was kept anonymous and confidential. The data from the responses was collected and entered into a password protected electronic spreadsheet. Only the researcher and advisor will have access to the passwords to access this data.

Surveys were administered to evaluate the adherence of student-athletes to the NATA Guidelines on Prevention of Skin Diseases as well as any barriers that may cause an issue to following the recommended measures.

Hypotheses

Research Question: Are student-athletes adhering to the NATA guidelines on Prevention of Skin Diseases?

Hypothesis: The survey results will show that the student athletes are adherent to the NATA guidelines on Prevention of Skin Infections thus, decreasing their chances of getting a skin disease.

Data Analysis

The statistical method and package that was used to analyze the data of this survey was SPSS version 22.0 for windows. The survey had a scoring method applied to the responses of each question. The questions have an answer that is considered "correct" according to the NATA guidelines that are being referred in the survey. For each guideline, the "correct/incorrect" score percentage determined if the student athlete is adhering to that specific guideline or not. The answer(s) that is considered correct have a value of 1 point. If the participant doesn't answer with the correct answer, they will not receive a

point for that question.

For guideline #3-#7, there are 5 questions related to each guideline. If a participant answered a correct response to at least 3 of the 5 questions for each separate guideline, then that showed that they were adherent to that specific one. For the questions that relate to the barriers, the scoring method was not applied as results are presented descriptively.

RESULTS

Demographic Data

Collegiate athletes from California University of Pennsylvania, King's College, and Washington and Jefferson College (N = 117) voluntarily participated in this study. All participants were 18 years of age or older.

Table 1 represents the gender of these student-athletes.

Table 1. Gender of athletes

Gender	Frequency	Percent
Male	48	41%
Female	69	58.9%

Table 2 represents which college/university the participants were enrolled as student athletes at.

Table 2. College/University enrollment of athletes

College/University	Frequency	Percent
California University of Pennsylvania	10	8.5%
King's College	91	77.7%
Washington and Jefferson College	16	13.6%

Table 3 represents the sport(s) that the student-athletes participate in at the involved schools. Other

represents sports that weren't specifically listed in the criteria. The eight participants that answered other to this survey question were involved in cross country (3 participants), volleyball (1 participant), and field hockey (4 participants).

Table 3. Sports participation of athletes

Sport	Frequency	Percent
Soccer	19	16.2%
Basketball	9	7.69%
Football	15	12.82%
Lacrosse	22	18.80%
Swimming	9	7.69%
Wrestling	2	1.71%
Baseball	6	5.13%
Softball	15	12.82%
Track and Field	21	17.95%

Table 4 represents the class year that the student-athlete is considered as in their sport.

Table 4. Class Year of Student-Athlete

Class	Frequency	Percent
Freshman	54	46.1%
Sophomore	28	23.9%
Junior	23	19.6%
Senior	11	9.4%
5 th Year	1	0.8%

Hypothesis Testing

The following hypothesis was tested in this study. To answer this hypothesis, each of these guidelines on the Hygiene Practices in Athletes survey had five questions that determine if subjects are adherent to the specific NATA Guidelines on Preventing Skin Diseases. Each guideline was analyzed specifically.

Hypothesis: The survey results will show that the student athletes are adherent to the NATA guidelines on Prevention of Skin Infections thus, decreasing their chances of getting a skin disease.

Conclusion: The results from the hypothesis showed that there was a higher percentage of student-athletes being adherent to NATA guidelines #3-#7 as opposed to being non-adherent.

Table 5 shows the adherence level to each guideline including the number of participants and the percentage of them that were either adherent or non-adherent to each specific guideline utilized throughout this survey.

Table 5. Adherence/Non-Adherence Level *n(%)*

Guideline	Adherent	Non-Adherent
Guideline #3	80 (68.4)	37 (31.6)
Guideline #4	61 (52.1)	56 (47.9)
Guideline #5	112 (95.7)	5 (4.3)
Guideline #6	103 (88.0)	14 (12.0)
Guideline #7	62 (53.0)	55 (47.0)

Additional Findings

Additional results were found for questions pertaining to barriers of implementation where majority of student-athletes showed that they do not have any barriers to implement these recommended preventative measures set by the NATA. 71.1% reported that there are hand sanitizer dispenses located in the athletic facilities that are utilized, 81% reported that there are showers available in their athletic facilities to utilize after activity, 50.4% reported that they are not expected to clean their own athletic equipment, 75.6% reported that they can locate the first aid kit in their athletic facility, and 92.7% reported that they do have the proper wound care supplies available at all times when needed.

Although majority of the student-athletes portrayed

that they do not have as many barriers to implementation for them, there were still some participants that showed they do have barriers present. Specifically, 28.8% of the participants did not have hand sanitizer dispensers placed in their facilities that are utilized, 18.9% reported that there are not showers available in their athletic facilities to utilize after activity, 49.5% reported that they are expected to clean their own athletic equipment, 24.3% reported that they cannot locate the first aid kit in their athletic facility, and 7.2% reported that they do not have the proper wound care supplies available at all times when needed. These results indicate that there are barriers present for some of the student-athletes.

Additional findings also related to supplemental questions to the sharing of specific items for guideline #5. These results showed a high percentage that the subjects who responded "yes" to these questions are sharing these items at least once with other athletes. Results portrayed that 84.7% of the 59 participants that answered have shared clothes with other athletes at least once. These additional results show that 70% of the 10 participants that answered have shared towels, 55% of the 18 participants that answered have shared athletic gear most of the time, 53.7% of the 80 participants that

answered have shared water bottles on a daily basis, and 75% of the 4 participants that answered have shared disposable razors and hair clippers at least once with other athletes. These additional findings somewhat show that although there's a high percentage of adherence to the guideline, some participants are still putting themselves at risk for getting a skin disease with these findings.

Additional results were also obtained from collecting responses on examining if the participants utilize antimicrobial soap when showering after every practice or game. Of the 113 participants that answered this supplemental question, 46% do use antimicrobial soap when showering after activity, 15.9% use antimicrobial soap sometimes after activity, and 38% do not use it. Lastly, additional results showed that some reasons as to why a four participants do not get their clothing cleaned frequently are because they "are swimmers and their bathing suits aren't usually washed" and having a lot of athletic clothes does not require them to launder them frequently.

DISCUSSION

This section is will include three subsections:
Discussion of Results, Conclusions, and Recommendations.

Discussion of Results

The participants showed that majority of the student-athletes are adhering to the NATA Guidelines on Prevention of Skin Diseases. The NATA guidelines portrayed these preventative measures for student athletes to follow to avoid getting some sort of skin disease.¹ The guidelines of #3-#7 were the guidelines that mainly pertained to student-athletes' hygiene habits.³ The questions that were included in the Hygiene Practices in Athletes survey reflected these guidelines in the best way. The results of this survey from the participants showed that they were mostly adherent to guideline #5 which relates to athletes sharing specific items like clothing and hair clippers with other athletes. Steven et al shows how this is one of the most important guidelines to follow for the athletic population due to the easy access of sharing these items amongst themselves.¹ The additional results show the percentages of the athletes who

did respond saying that they are sharing these items. The percentage of these specific participants is higher with the response of the athletes sharing these items at least once. The NATA guidelines show that they should not be sharing these items at all to prevent skin diseases from occurring.¹ This goes for sharing water bottles amongst each other also.¹ In this case, the percentage of participants that answered "yes" to sharing water bottles was 87.9%. The NATA guidelines do state that although this is difficult for the athletes to not do, it is putting them at risk of contracting a skin disease.¹ It is important for athletic trainers to be aware if this activity is occurring with our athletes and educate them on how important it is for them to stop sharing these items. Table 6 shows the frequency and percentage of the participants that answered the question pertaining to sharing water bottles.

Table 6: Answer responses to "Do you share water bottles with your fellow players?"

Answer	Frequency	Percent
Yes	79	67.5%
No	38	32.5%

The next guideline that the participants were mostly adherent to was guideline #6 which pertains to wound care and usage of cold/warm whirlpools in the athletic training

room.¹ Ferger et al also portrayed in his study about the usage of therapeutic equipment and open wounds.² In his study, it shows that 43% of wrestlers and 56% of basketball players at the collegiate level reported that they have used a whirlpool without covering an open wound.² As for this survey, a similar question was asked to the student-athletes and the result was that 86.3% of the participants do not use the whirlpool with open wounds present. This shows that although this survey has an increased number of athletes that are utilizing the whirlpool with covered wounds, these still that percentage of student-athletes who are using it with uncovered wounds. Therefore, it is still the athletic trainers' job to ensure that they are covering wounds before usage of the whirlpool. Table 7 shows the frequency and percentage of the participants that answered the question pertaining to whirlpool usage and wound covering.

Table 7: Answer responses to "Have you ever utilized a common warm, or cold, whirlpool with an uncovered open wound present on your skin?"

Answer	Frequency	Percent
Yes	16	13.7%
No	101	86.3%

The results from the questions reflecting NATA

guideline #3 pertains to the participants following proper hand hygiene practices.¹ Lear et al and Kruger et al both portray articles that emphasize proper hand hygiene to avoid viral infections and MRSA from occurring amongst athletes.³⁻⁴ Lear et al shows that at least 56% of high school athletes do not wash their hands after activity in their sport.³ For this study, that variable was measured with a question that related to hand washing after coming in contact with sports equipment. The percentage to the response of "I always do", which is the correct response, was 10.3%. This was the least chosen response out of 117 participants. Although the participants were adherent to this guideline as well, this suggests support of Lear et al's conclusion as to athletes not washing their hands as frequently as they should be doing.³ Table 8 shows the frequency and percentage of the participants that answered the question pertaining to frequency of hand washing included in this survey.

Table 8: Answer responses to "How frequently do you wash your hands after contact with sports equipment?"

Answer	Frequency	Percent
I usually do	49	41.9%
I sometimes do	40	34.2%

I always do	12	10.3%
I seldom do	16	13.7%

As for Krueger et al's article, he portrays that 74% of athletes believe that using an alcohol based rub, like hand sanitizer, is better and just as effective as washing their hands with soap and water.⁴ In this survey, a question was asked to the participants pertaining to this finding in Krueger et al's article. The question related to what solution do they use when cleaning their hands. The NATA guidelines state that using a liquid dispense is the best option.¹ The percentage for this response was 83.8%, thus showing that the athletes have some understanding that using liquid dispense solution and water for hand hygiene has a longer effect than an alcohol based rub which is used for short term.^{1,4} These results also show that athletic trainers have to educate and emphasize the difference between the two hand hygiene methods. Both methods are effective in preventing skin diseases from occurring, but we must educate them on which one should be used at which moment. Table 9 shows the frequency and percentage of the participants that answered the question pertaining to which cleaning solution is being used when cleaning their hands.

Table 9: Answer responses to "When your hands are visibly dirty, do you wash them with:"

Answer	Frequency	Percent
Liquid Dispenses	98	83.8%
Bar Soap	12	10.3%
Alcohol-based rub	7	6.0%

One of the unique findings that was found relates to NATA guideline #4 which pertains to athletic equipment, clothing, and shower hygiene. Specifically, the findings of the frequency of laundering and cleaning clothes for athletics was unique. The NATA established that their clothing that they use for activity should be cleaned on a daily basis.¹ An article that presented preventative measures and information on MRSA opposed this in a way.⁵ These preventative measures were set by a clinic in Arkansas for rugby players to avoid contracting skin diseases.⁵ Unlike the recommendations set by the NATA, this clinic stated that athletes should clean their clothing at least 2-3 times a week unlike the NATA that states it should be cleaned on a daily basis.^{1,5} As for this survey, I asked the participants how often do they clean their clothing for athletics. The response results came back as "1-2 days a week" with 45.3%, "3-4 days a week" with 23.1%, "5-7 days a week" with 29.1%, and "None of the above" with

2.6%. Relating to the measures set by the NATA, most of the participants were incorrect with answering mostly with "1-2 days a week".¹ Thus, the clinic in Arkansas would state that this is fine and would help decrease the likelihood of getting a skin disease.⁵ Although for this study we are referring to the NATA recommendations on prevention skin diseases, this suggests that the recommendation set by this clinic could help with prevention also. Table 10 shows the frequency and percentage of the participants that answered the question pertaining to frequency of their athletic clothing getting cleaned that was included in this survey.

Table 10: Answer responses to "How often do you clean your clothing for athletics?"

Answer	Frequency	Percent
1-2 days a week	53	45.3%
3-4 days a week	27	23.1%
5-7 days a week	34	29.1%
None of the above	3	2.6%

One of the respondents who answered "None of the above" for this question answered the open ended supplemental question of stating a reason as to why their clothing doesn't get cleaned frequently with an intriguing answer. The respondent stated that their reason as to not cleaning

their clothes as frequently was due to having so much athletic clothing that they do not have to launder and clean them for at least a week. In this case, this made me think that as long as they aren't using the same unlaundered and uncleaned clothes frequently, then they are not putting themselves at risk of getting a skin disease if they are wearing clean clothes each time for activity. Therefore, both recommendations could be taken into consideration when it comes to how frequently athletic clothing should be cleaned to prevent skin diseases. Also, in this case, athletic trainers need to emphasize that the athletes shouldn't wear uncleaned clothes repeatedly without being cleaned to avoid getting a skin disease also.⁵

The NATA emphasizes in the Guidelines on Prevention of Skin Diseases that athletes who sustain an open wound should report it to a their available health care provider and medical personnel.¹ As for guideline #7 in the recommendations, this specifically states that they should report it to the athletic trainer. Most (67.5%) of the respondents reported that they do not report open wounds to their athletic trainer nor any medical personnel of any kind. Pedersen et al shows in a similar study that 94% of collegiate athletes reported their open wounds to their athletic trainer. Our results do not support Pedersen's

study and may be a cause for concern. Table 11 shows the frequency and percentage of the participants that answered the question pertaining to if the participants report sustained cuts and wounds to the athletic trainer.

Table 11: Answer responses to "Do you report any minor cuts/wounds to your health care provider, including the athletic trainer, physician, health center, etc.?"

Answer	Frequency	Percent
Yes	11	9.4%
No	79	67.5%
Sometimes	21	17.9%

It is surprising that a majority of athletes do not report cuts/wounds to the athletic trainer, considering the fact that they have athletic trainers there full-time at each school involved in this study. Perhaps, athletic trainers should establish upfront with the athletes that even minor cuts/wound should be alerted to them due to risk of infection.

This study also looked to identify any possible barriers that could be present in regards to not implementing these guidelines set by the NATA on preventing skin diseases. The results from the Hygiene Practices in Athletes survey for this study showed a high percentage of barriers not being present for the athletes to implement

and follow these guidelines. Barriers were classified as ensuring that hand sanitizers were located throughout their athletic facilities, available showers in the athletic facilities for the athletes to use after activity, self-equipment cleaning, knowledge of where the first aid kit is located in athletic facilities, and wound care supplies availability when needed. The majority of the participants portrayed that none of these served as a detriment to them at their athletic facilities thus not being a barrier to them.

Conclusions

There has been an adequate amount of research that relate to this study. Research has shown that implementing guidelines for athletes to follow is needed to help prevent skin diseases in the best way possible. The hypothesis being proven in this study shows that the student athletes are adhering to the NATA Guidelines on Prevention of Skin Diseases. The results of these student athletes adhering to the recommended measures shows that they are decreasing their chances of contracting a skin disease.

Another conclusion that was drawn from this study was that there is a low percentage of barriers being a

detriment to implementation for the athletes to follow the guidelines set by the NATA. Similar studies that were examined and mentioned in this did show that there are possibilities of barriers arising at any time that could be a problem as to athletes following the guidelines. As of now, the survey results from the Hygiene Practices in Athletes survey show that barriers are not present in the schools surveyed. Although this is a positive impact on decreasing the cases of skin disease amongst athletes, there still must be some action taking place to ensure that these barriers continue to not arise.

For future research, it would be best to ensure that coaches understand how important it is for their athletes to adhere to these guidelines. Therefore, it would be best to survey them about their awareness on proper hygiene practices for their athletes. They should also be surveyed on how much they are educating and emphasizing proper hygiene practice to their athletes. The reason why this future research should occur is because coaches play a major role in educating the athletes on prevention of skin diseases too. This could also help decrease the percentage of non-adherence level of athletes due to the fact that now they have coaches and athletic trainers emphasizing and educating them on prevention of this. In conclusion,

conducting this future research will also help with more implementation of the NATA guidelines. This will help break any possible barriers that maybe present to implementation of the guidelines also. If the coaches are able to identify barriers similar to how the student athletes did in this study, then there would be a decrease in possible barriers also.

Recommendations

Overall, the student athletes had a higher percentage in adherence compared to non-adherence. Thus, there was still moderate percentage in non-adherence for guidelines #3, #4, and #7. This shows that although the student-athletes are adhering more as opposed to being non-adherent, some participants are still at risk of getting a skin disease. Therefore, the primary recommendation from this study to ensure that they still adhere to the NATA Guidelines on Prevention on Skin Diseases is to continue to educate the athletes on how important it is to follow these guidelines. This could come about by having informational presentations during pre-season meetings with the athletic teams that the athletic trainer may work with. This could

also happen by placing copies of the guidelines throughout campus, school buildings, and athletic facilities. The one action that athletic trainers need to do is to establish these guidelines outside of the athletic training room. This is where placing copies of the NATA guidelines or some sort of written guideline around other locations other than our facilities. Lastly, one must remember that as athletic trainers we play a major role in ensuring that these guidelines are being implemented to our athletes to help prevent skin diseases. The NATA set these guidelines therefore athletic trainers need to assure that they are aware of any new research or position statement that may update these guidelines in the future. Athletic trainers also must continue to understand the treatment protocol for different skin diseases in the cases that an athlete does obtain one. In conclusion, athletic trainers have the knowledge and clinical skills to help keep these athletes safe from skin diseases and ensure that they continue to adhere to the NATA Guidelines on Prevention of Skin Diseases.

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APPENDICES

APPENDIX A

Review of Literature

REVIEW OF LITERATURE

Introduction-

Skin diseases are highly common in the athletic population.¹⁻¹² These diseases has caused athletes to miss playing time in their sport due to possible spread of the infection that they have.¹⁻²⁸ Although this is treatable issue, it does become a bigger problem once it's contagious and causes a widespread.^{2-5, 11, 21} Most athletes either contract the skin disease from another individual or from unsanitary conditions. These unsanitary conditions relate back to poor hygiene practices of the individual.^{1-5, 25-28} There is considered two different types of transmission of skin diseases.¹⁻¹² There is an indirect and direct transmission. Indirect transmission occurs between an athlete and a playing surface.⁵⁻⁸ There has been several cases of indirect transmission in the athletic setting that relates to unsanitary playing fields or surfaces, clothing, water bottles, athletic equipment, and/or athletic locker rooms.⁵⁻⁸ Direct transmission occurs when an infected person transfers the infectious agents to another through skin to

skin contact.⁵⁻⁸ The Occupational Safety and Health Administration (OSHA) has set standards to try and minimize the spread of any type of possible infections.¹⁻¹² Medical personnel, mostly dermatologist, have also shown that most athletes report not washing their practice equipment which causes them to sustain some sort of skin disease.^{11-15,21,30} The types of skin diseases that are seen in athletes are classified by bacterial, viral, or fungal.¹⁻⁴

According to the National Collegiate Athletic Association (NCAA) Injury Surveillance System, it shows that abnormal skin conditions are contributed equally from each of these types of skin infections. According to this statistic, 17.2 percent of athletes lose participation time due to skin diseases, 45.3 percent of skin diseases are caused by a virus, 24.9 percent are caused by bacteria, and 22.1 percent are caused by a fungal infection.^{1-7,10,15-17} In order to treat these infections, the proper medicine must be used depending on the type of infection that the athlete has.²⁻⁶ This means that the treatment primarily begins by properly diagnosing what type of skin disease the athlete has so the proper medicine could be described to them by the appropriate medical personnel.⁴⁻⁷ It's also very important to recognize and specifically diagnose each skin infection because many of them may present as the same.¹⁰⁻¹⁵

The prescribed medicine could be classified as oral or topical application for the athlete.⁴⁻⁷ One of the most important factors that comes with this issue is prevention of skin diseases.^{1-7,28-30}

Prevention methods mainly include practicing good hygiene habits, being educated on the types of skin diseases, knowing how to recognize it early, and knowing who to report to once an athlete feels that they contracted a skin disease.^{1-5,16,18,21-23} Athletic trainers are considered the personnel that should educate their athletes on what they should do to avoid contracting a skin disease since they are the primary health care personnel that cares for them on a consistent basis.^{2-4,9-15} The National Athletic Trainers' Association (NATA) has established and published guidelines on preventing skin diseases that includes recognition and education as big aspects of the prevention protocol along with steps to treating the skin disease.³ In relation to these guidelines on the prevention methods of skin diseases, there is also specific sections of the research that speaks on how there are some barriers to as to why prevention of skin diseases could possibly be difficult to follow.²⁷⁻³⁰ This serves as a detriment as to why student-athletes may not be implementing the prevention guidelines on skin diseases thus increasing their chances

to contract some sort of skin disease.²⁸⁻²⁹ Overall, the literature and research presented here also portrays what we need to know specifically on how a bacterial, viral, and fungal skin disease presents when an athlete contracts one of these and how to differentiate them from each other.^{1-2,9-17,21,25}

Transmission of Pathogens-

Infectious skin disease outbreaks have been a part of sports throughout the history of athletics.¹³ One of the earliest outbreaks dates back to 1922 with a chlamydia outbreak in professional wrestling.¹³ Before learning about the prevention of skin diseases, first there must be a firm understanding of the way transmission happens. In order for the transmission of a pathogen to take place there needs to be a presence of a large quantity of the infectious pathogen.^{14-17,21} If there is not enough then there will be no transmission. Next, there needs to be a mechanism of the pathogen from one host to the next followed by a portal into the new host.²¹ This is including mechanisms such as skin-to-skin contact or sharing of clothing that make be contaminated already. Last, the new host needs to be susceptible to the new pathogen.⁵⁻⁹ Athletes for the most part are at a low risk for the outbreaks infectious

pathogens.¹⁴ There have been many accounts reported about the transmission of infectious pathogens that cause skin diseases during athletics.¹⁴ Bacterial, viral, and fungal infections have equally contributed to the transmission of skin diseases amongst athletes today.²¹

There is considered two different types of transmission. There is an indirect and direct transmission. Indirect transmission occurs between an athlete and a playing surface.^{5,14} There has been many cases of indirect transmission in athletic setting that is found in the literature.⁷ Direct transmission occurs when an infected person transfers the infectious agents to another through skin to skin contact.^{3,8} Ferger et al found 68 reported cases of infectious disease outbreaks in competitive sports from 1955 through 2006.²³ Of these cases the herpes simplex virus accounted for 22% while staphylococcus aureus accounted for 13%.²³ The most common mode of transmission was person to person contact.²³ This study also portrayed that most of the outbreaks are caused by person to person contact compared to indirect transmission.²³ Indirect transmission occurs when a person comes in contact with a contaminated surface or item.^{3,8,14,27} An example with this would be if a wrestler who has impetigo is stretching on a wrestling mat before a match and then another wrestling

stretches in that same exact spot thus putting him at risk to indirectly get impetigo as well. Along with the National Athletic Trainers' Association, the Occupational Safety and Health Administration (OSHA) has set standards to try and minimize the spread of infectious pathogens that cause skin diseases.^{3,8,14}

Skin Diseases-

Bacterial skin diseases occur .^{1,3,28-30} Bacterial disorders mainly include impetigo, abscesses, folliculitis, furuncles, boils, carbuncles, paronychia, or onychia.^{1,3,20-28} The most difficult bacterial infection to deal with is Methicillin Resistant Staphylococcus Aureus (MRSA) which is fatal at times if not treated and controlled properly.¹⁻¹² Impetigo and Staph infections are the most common in athletics.¹⁻⁶ Two clinical types of impetigo exist: nonbullous and bullous.^{4,6} The nonbullous type is more common and typically occurs on the face and extremities, initially with vesicles or pustules on reddened skin. The vesicles or pustules eventually rupture to leave the characteristic honey-colored (yellow-brown) crust.^{4,6} Staphylococcus Aureus is a common bacteria that arises from poorly treated wounds.⁴⁻⁸ Staph infections can turn deadly if the bacteria invade deeper into your body, entering your bloodstream, joints, bones, lungs or heart. A growing

number of otherwise healthy people are developing life-threatening staph infections.⁸⁻¹⁹ Bacterial skin diseases are usually caused by untreated open wounds, scrapes, and cuts or abrasions.³⁻¹⁰ These skin infections caused by bacteria mostly shows as lesions that crust over with pus or pusicles that have a drainage coming out of it.³⁰ These disorders are treated with an anti-bacterial medication at all times.¹⁰⁻¹⁹

Perhaps one of the most researched bacterial infections is MRSA.³³ Each year approximately 12 million American visit the doctors to get evaluated for MRSA.^{2-9,33} The CDC has identified MRSA as an emerging health risk and this could be the reason for the large amounts of studies.^{9,33} MRSA is a group of bacteria that are resistant to treatment with methicillin.⁸⁻⁹ For this reason, MRSA can be difficult to treat and kill once someone has got infected. MRSA can then be broken down even further into community-associated and hospital associated MRSA.^{8-9,33} MRSA usually presents as pimples or boils and sometimes can even look like a spider bite.^{2,8} MRSA is diagnosed clinically but should then be followed up with a culture test.² MRSA is then treated with strong anti-bacterial drugs.

Other highly contagious bacterial infections include Impetigo.⁶ Impetigo is one of the most commonly reported

skin infections in athletics.⁶ It usually presents as a well-defined yellow-crusted or honey-colored crust over a lesion.^{2,5,6} The diagnosis of impetigo can be made clinically but can also be followed up with a culture.² The athlete will then be prescribed anti-bacterial medicine and should wash their skin often to prevent further spread of the infection.²

Viral skin disorders mainly include sexual transmitted disease, but the infection that occurs mostly in the athletic population includes herpes simplex.³⁻³⁰ These infections are treated with anti-viral medication and could keep an athlete out for 2-3 weeks if treated right²⁻¹⁰ Skin infections caused by a virus mostly show as small lesions that crust over with a "yellowish" substance.¹⁰⁻¹⁸ Another Viral infection includes Molluscum Contagiosum which are very contagious.^{3,10-19}

Herpes Simplex Virus (HSV) is a concern for sports such as wrestling where athletes work in close quarters. Recent data suggest that 29.8% of the high school wrestling population could be affected by the virus.⁶ Approximately 60% of college student's possessed antibodies for the herpes simplex virus.³ Herpes simplex actually lives in a dormant state in the sensory nerves of the skin.⁹ Herpes in wrestling is termed herpes gladiatorum.^{6,15} Herpes usually

presents as grouped vesicles and erythematous base and has raised vesicles with clear fluid inside.^{6,15} The primary mode of transmission for herpes is full skin-on-skin contact.² Treatment for herpes simplex includes anti-viral medications. The most commonly used for herpes is valacyclovir.³ Unfortunately for Herpes there is no cure for the virus so the athlete will have the virus for the rest of their life.⁶

Another viral skin condition the athlete can be affected with is Molluscum Contagiosum. Molluscum is caused by the pox virus and generally appears on the groin, armpits, and behind the knees.⁶ Molluscum is much different than Herpes as it is not highly contagious, does not live dormant in the body, and once the papules are gone so is the virus.⁹ Molluscum is also interesting as there is not specific course to treatment. According to the NATA position statement physical destruction of the lesions with a sharp curette is recommended.²

Fungal infections are very contagious also compared to viral infections.^{3,8} Skin infections caused by a fungus usually show as a "scraping" or rough patch on the skin that turns red when irritated.^{3,7,22} These infections mostly include Tinea Capitis, Tinea Corporis, and Tinea Pedis.^{3,22} Athletes mostly contract this skin infection from poor

hygiene habits and not washing appropriate equipment and clothing.³⁻¹⁰ An athlete with this skin infection will usually be out for 3 weeks if treated properly.³⁻¹⁹ They also could contract this type of skin disease from indirect contact. Indirect contact would include an individual touching a contaminated surface or item of some sort.²² As for fungal infections, it is highly susceptible for an individual to get this type of skin disease through indirect contact with a surface.^{3,8,22} In a study performed by Wilson et al, they studied wrestling mats to determine if dermatophytes could be colonized on wrestling mats.²² Dermatophytes are fungi that require keratin for growth. These fungi can cause superficial infections of the skin, hair, and nails. The study looked at wrestling mats at 8 separate high schools.²² The wrestling mats had swabs performed on them by the researchers. The schools mats were cleaned before the swabs were performed. The study found that 3 out of the 8 mats had dermatophytes present on the wrestling mats.²² With this data, it came to the conclusion that the wrestling mats be cleaned on a daily basis and to ensure that it does by the necessary personnel to prevent the spread of fungal skin infections from happening.²²

Guidelines for Prevention and Treatment-

There's more to treating a skin infection other than

topical or oral prescribed medicine and holding the athlete from participation.²⁻⁷ In terms of treating and preventing dermatological infections, the National Athletic Trainers' Association (NATA) put together a position statement that mainly emphasizes recommendation guidelines on how to control this type of problem.³ The following are several guidelines including in the NATA Position Statement on skin diseases; "Organizational support must be adequate to limit spread of infectious agents, a clean environment must be maintained in the athletic training facility, locker rooms, and all athletic venues, health care practitioners and athletes should follow good hand hygiene practices, athletes must be encouraged to follow good overall hygiene practices, athletes must be discouraged from sharing towels, athletic gear, water bottles, disposable razors, and hair clippers, athletes with open wounds, scrapes, or scratches must avoid whirlpools and common tubs, and athletes are encouraged to report all abrasions, cuts, and skin lesions to and to seek attention from an AT for proper cleansing, treatment, and dressing."³

These are all great recommendations made by the NATA, but the two that I want to go into more detail about are the recommendations on hygiene of the athletes and facilities. The National Athletic Trainers' Association

emphasizes how these are important guidelines that we should follow and I agree. They state how all facilities used by the athletes should be cleaned.³ This means, "cleaning and disinfecting locker rooms, wrestling mats, benches, lockers, treatment tables, and any touched surfaces frequently, having a detailed and documented cleaning schedule that should be implemented in all areas, and using an appropriate disinfectant or detergent that should be registered with the Environmental Protection Agency, and the manufacturer's recommendations for the amount, dilution, and contact time should be followed and observed."³ All facilities, including homes and occupational, should be cleaned at least twice a day.²⁵⁻²⁹ This includes if it's in usage or not in usage. This will ensure that no bacteria grow within the facilities that will establish an unsanitary environment.^{3-7,10,25-29}

The next guideline that is very important in terms of preventing and treating a skin infection is how athletes should be encouraged to follow good hygiene practices.³ The NATA also follows up by stating the stand points; "Athletes must shower after every practice and game with an antimicrobial soap and water over the entire body, it is best for the athletes to shower in the locker rooms provided by the athletic department, athletes should

refrain from cosmetic body shaving, soiled clothing, including practice gear, undergarments, outerwear, and uniforms, must be laundered on a daily basis, and equipment mainly including knee sleeves, knee braces, ankle braces, etc should be disinfected in the manufacturer's recommended manner on a daily basis." Proper wound care and following OSHA guidelines are also tied into these two important prevention guidelines. Another supporting article also states similar guidelines that are related to these stated in the NATA guideline.^{18,20} The following guidelines that are stated mainly come from two health research articles that proclaim to have the most efficient practice for hygiene to avoid contracting a skin disease. Anderson and Draelos have established these guidelines in athletic settings to help promote prevention of skin diseases also.¹⁸⁻²⁰ These guidelines reflect and relate to the same prevention guidelines that the NATA set in their position statement. The guidelines for skin disease prevention that Anderson and Draelos promoted are as follows:

Keep cuts and scrapes clean and covered with a bandage until healed- A cut or scrape weakens the skin's defense and allows germs that cause infections to enter.

Prevent blisters to reduce infections- Apply a pad, gel or spray to areas that routinely blister. To help prevent

blisters on the feet, ankles and hands, consider using specialized gloves and socks or wearing two pairs of socks. Athletes should also make sure that their footwear fits properly.

Wear moisture-wicking clothes- This helps keep the athlete's skin dry and prevents germs from growing.

Wear sandals in the locker room- Wearing sandals or other shoes helps reduce infections on the feet.

Shower after every practice and game- In addition, athletes should use an antimicrobial soap and wash their entire body.

Do not share personal care items- Athletes should always use a clean towel after showering and use their own towels, soaps, razors and other personal care items.

Wash clothes and towels after each use- Sports bags should also be washed, as germs that cause infections can remain in the bags and grow.

Disinfect equipment, including protective gear, daily- For proper disinfection, follow the manufacturers' instructions.

Perform regular skin check- Athletes should check their skin daily, especially those in high-risk sports, such as wrestling. Look for any changes, such as cuts, sores, redness, swelling and pus, and report any changes to an

athletic trainer or doctor.

Never use sandpaper or bleach to pass a skin check- This will cause more damage to the skin and keep the athlete on the bench longer.

Although these are two main recommendations that are important, it is best for all facilities and athletic trainers to implement all of the guidelines.^{3,18,20} Following these guidelines established by the NATA and the guidelines promoted by Anderson and Draelos will assist with decreasing the likelihood of an athlete getting a skin disease.^{3,18,20} Thus, there are still some barriers that serve as a detriment to implementation of these guidelines.²⁷⁻³⁰ Lear portrayed several possible barriers in a case study of a *Staphylococcus aureus* (Staph.) infection amongst football players at a high school.²⁷ This case study portrayed that high school athletes possibly do not know where to locate a first aid kit that is needed when an open wound is sustained.²⁷ Lear shows here that the barrier of not knowing this leads to the open wound not receiving proper care thus putting it at risk to turn into some kind of bacterial infection. In this case, Lear suggests that the medical personnel at the high school should inform the coaches of the football team of the locations where the first aid kits are in the school. This will allow the coaches to then

inform the players where the first aid kits are for when, or if, they sustain an open wound.²⁷ First aid kits contain the proper cleaning solutions and coverings to help with proper wound care and decreasing the risk of a bacterial infection occurring in an individual.^{27,29} This case study shows that if this plan of action takes place, then it will eliminate this possible barrier of athletes not having knowledge of where the first aid kits are to clean and cover their wound.²⁷ Lear also highlights in this case study how wound care items such as alcohol swabs, gauze pads, hydrogen peroxide, and band aids should be available to the student-athletes at all times.²⁷ If these items aren't available for their use when needs, this increases their risk of contracting a skin disease of some sort also.²⁷ Another possible barrier relates to if there are showers located in the athletic facilities for the athletes to utilize after activity.²⁸

Guideline #4 of the NATA Guidelines on Prevention of Skin Diseases emphasizes how it's best for the athletes to shower in their athletic facility after practices and competitions.³ Krueger et al has portrayed in their article that non-working showers in athletic facilities has put collegiate wrestlers at risk of the viral infection molluscum contagiosum.²⁸ Wrestlers have been known to be put

at the highest risk of contracting some kind of skin disease due to the constant direct skin-to-skin contact that they endure amongst each other.²⁸ In this case, a collegiate wrestler contracted the viral infection molluscum contagiosum and reported that he wasn't showering after wrestling practice and competitions. This relates back to the cause of skin infections which is poor hygiene amongst the athletes.^{1-3,28} Krueger et al also show in this article how it was reported how the showering facilities had malfunctions for a brief period of time prior to the wrestler contracting this skin disease.²⁸ This is portrayed as a barrier due to the fact that the wrestler could've prevented this if he was able to shower in the athletic facilities immediately after activity. The malfunctioned shower was fixed after a certain amount of time thus, opening up a better opportunity to implement the guideline set by the NATA to prevent skin diseases.^{3,28}

Lastly, Ferger et al shows a study where student athletes in both the high school and collegiate setting implementing written guidelines to prevent MRSA.²³ The primary reason for this implementation of MRSA prevention written guidelines is because there are athletic trainers present at these schools that educated these athletes prior to pre-season activities occurring.²³ Since the

implementation of these guidelines by the athletic trainers, there was a 8% decrease of skin diseases amongst the athletes in high school setting and 11% decrease amongst the athletes in the collegiate setting.²³ Therefore, it was interpreted by Ferger et al in the discussion section of this study that a possible barrier to implementation of guidelines for skin disease prevention is that there aren't athletic trainers employed at every school to help educate athletes on MRSA.²² Although it is difficult to have an athletic trainer at every school setting, this would be very helpful for athletes to prevent skin diseases from happening. Ferger et al's study shows how important an athletic trainer's presence in school athletics are.²³ The importance of athletic trainers in this case of preventing skin diseases is that they are the first ones who could begin the process of implementing guidelines for prevention and help ensure that the student athletes adhere to them.^{3,23,28}

Summary-

Skin diseases are very common in athletes in today's world.¹⁻³⁰ There are three types of bacterial infections that include bacterial, viral, and fungal.^{2,5-9,20-29} These infections are mainly treated by topical ointment medication that is prescribed to the appropriate patient.¹⁰⁻

¹⁹ Most importantly, prevention is very important where the NATA set guidelines that should be followed.³ This mainly emphasizes on how good hygiene habits should be practiced and facilities should be cleaned daily. The reason why these two recommendations are emphasized are because skin infections are contracted through skin to skin contact due to poor hygiene.^{1-10, 17-21} Poor hygiene relates to an individual who doesn't practice good cleaning habits of health. This mainly relates to the physical well-being of an individual.^{3-7, 11,18} Thus, poor hygiene also relates to unsanitary environments. Bad habits of hygiene include not cleaning clothes, not showering, not brushing teeth, not washing hands, and not cleaning the environment around you.³⁻⁷ Another bad habit, that should never be accepted, is not following OSHA guidelines within the health profession.³⁻⁷ In conclusion, the most important thing with the care of skin infections in an athlete is to educate them on these problems and recognize it early as an athletic trainer to prevent the infection from spreading.^{3,18,20-23}

APPENDIX B

The Problem

STATEMENT OF THE PROBLEM

As athletic trainers, we deal with athletes who have the perception that minor cuts and abrasions are minuscule injuries. Although they may appear as this, they could turn into something far worst if proper care isn't applied and provide. Skin diseases, or infections, could come about from these "miniscule" cuts and abrasions not being taken care of in a good fashion. Athletes still fail to understand that an infection could occur from the smallest cut if it isn't cleaned and covered when needed. The problem that also arrives with this is that if one athlete isn't aware that he contracted a skin disease, then he or she also isn't aware that he may be spreading to the rest of the athletes around them. Another problem that relates to this is how student-athletes also may be practicing poor hygiene habits. The hygiene habits mentioned here relate to hand washing, laundry maintenance, athletic equipment/clothing maintenance, wound care, and if they are reporting sustained wounds to a health care professional.

The National Athletic Trainers' Association has established guidelines on how to prevent skin diseases from happening amongst athletes. The purpose of this study are to determine if collegiate athletes are adhering to

recommended measures identified by the NATA guidelines on the prevention of skin disease and identify barriers to implementation of recommended measures. Adherence will be described as the level that the subjects do follow the guidelines that are set by the NATA. The results of this study will benefit athletic trainers in the best way. The reason to this is because athletic trainers could now assist with implementing these guidelines to preventing skin diseases set by the NATA. This will help with the education aspect to the student-athletes on prevention in the most positive way. Due to the results, the athletic trainer now knows that they must educate their athletes more on how to prevent skin diseases from occurring.

Definition of Terms

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

- 1) Adherence - attachment or commitment to a person, cause, or belief
- 2) Skin Diseases - an impairment or abnormal condition that occurs on the skin due to some sort of pathogen (bacteria, virus, or fungus).

- 3) National Athletic Trainer's Association (NATA) - is the professional membership association for certified athletic trainers and others who support the athletic training profession. Founded in 1950, the NATA has grown to more than 43,000 members worldwide today. The majority of certified athletic trainers choose to be members of NATA to support their profession and to receive a mass of membership benefits. By joining forces as a group, NATA members can accomplish more for the athletic training profession than they can individually.
- 4) Hygiene - conditions, habits, or practices to maintaining good health and preventing disease, frequently through personal cleanliness.
- 5) Methicillin Resistant Staphylococcus Aureus (MRSA) - infection is caused by a type of staph bacteria that's become resistant to many of the antibiotics used to treat ordinary staph infections.

Basic Assumptions

The following are basic assumptions of this study:

- 1) The subjects will complete the survey with honesty.
- 2) The subjects are aware of their hygiene practices.

- 3) The subjects will complete the demographics section honestly and accurately.
- 4) All respondents are currently active in a collegiate sport at the division II or III level.

Limitations of the Study

The following are possible limitations of the study:

- 1) Subjects may not complete the survey honestly.
- 2) Subjects can be inconsistent in responses.
- 3) Because the surveys relate to the personal nature of hygiene, subjects may be reluctant to answer honestly.
- 4) Subject pool is limited to Universities in which the investigator is associated with at some capacity

Significance of the Study

Throughout athletics, there has been many cases of skin infections arising among the athletes. These cases most of the time occur due to direct skin-to-skin contact among the group of athletes. For example, if one wrestler has impetigo and spars with another wrestler with the infected area uncovered, then that other athlete will get it too. Also, a skin infection could be contracted through sharing of clothing. Athletic trainers should be emphasizing how good hygiene habits are a primary factor

that helps with avoiding this issue. Most of these skin diseases are easy to contract through direct transmission which is why all of the athletes should also be educated on how to recognize abnormal skin lesions. Thus, this comes with proper education of how serious skin diseases are if contracted by an individual. As athletic trainers, we already have the knowledge of how to treat and prevent these types of disorders. We also already know how to recognize when an athlete has a skin infection.

The NATA has specifically established guidelines on preventing skin diseases that includes recognition and education as big aspects of the prevention protocol along with steps to treating the skin disease. In relation to these guidelines on the prevention methods, there is also information on how there are some barriers to as to why prevention of skin diseases could possibly be difficult to follow. It is important for these student-athletes to know of these guidelines being presented by the NATA on prevention of skin diseases. Another aspect that comes with this, is that there may be barriers as to why the student-athletes aren't adhering to the guidelines set by the National Athletic Trainers' Association.

The significance of this study is that the results will be able to gather the initial information portraying and

determining if the student-athletes are actually adhering to the guidelines or not. Next, this information will provide how their hygiene practices are and if this is a factor that puts them at risk of contracting a skin disease or not. Once this information is gathered and examined, then the athletic trainer could put together a possible plan of action to help implement the NATA Guidelines on Prevention of Skin Diseases. This will help with not only prevention of skin diseases, but also with raising awareness to the student-athletes on the pathology. This will allow the athletic trainer to educate them on how to recognize if a skin disease is contracted and what steps to take next to treat and prevent the widespread of it. The athletic trainer will also be able to identify what possible barriers that may be present to the student-athlete for not adhering to the guidelines. In this sense, this information will help the athletic trainer educate the student-athletes on how to avoid those barriers if they are present. Overall, the significance of this study is that as athletic trainers, we will have better ways to promote the NATA Guidelines on Preventing Skin Diseases to avoid this problem from occurring while continuing to establish a safe environment for the student-athletes under their care.

APPENDIX C

Additional Methods

APPENDIX C1

Survey



CALIFORNIA UNIVERSITY OF PA
ATHLETIC TRAINING

Hygiene Practices in Athletes

Demographic Information

* 1. What is your gender?

- Male
 Female

* 2. Are you 18 years old or over?

- Yes
 No

* 3. Which college/university are you currently enrolled as a student-athlete at?

- California University of Pennsylvania
 King's College
 Washington and Jefferson College

* 4. Which sport(s) are you associated with as a student-athlete? Please check all that apply:

- Soccer
- Basketball
- Football
- Lacrosse
- Swimming
- Wrestling
- Baseball
- Softball
- Track and Field

Other (please specify)

* 5. What class year are you considered as in your sport?

- Freshman
- Sophomore
- Junior
- Senior
- 5th Year

Hygiene Practices In Athletes

NATA Guideline #3

* 6. How frequently do you wash your hands after contact with sports equipment?

- I always do
- I usually do
- I sometimes do
- I seldom do

* 7. When your hands are visibly dirty, do you wash them with:

- Liquid dispenses
- Alcohol-based hand rub
- Bar soap
- None of the above

* 8. When you wash your hands, please select the technique that you mostly follow:

- Apply soap, wet hands, rub for approximately 5 seconds, and dry with a disposable towel
- Wet hands, apply soap, rub for approximately 15 seconds, rinse, and dry with a disposable towel
- Wet hands, apply soap, rub for approximately 5 seconds, and dry with a disposable towel
- Wet hands, apply soap, rub for approximately 15 seconds, and dry with a disposable towel

* 9. When your hands aren't visibly dirty but you know you still need to clean them (i.e. after practice), do you routinely use an alcohol based hand rub or wash with antimicrobial cleanser from a liquid dispense?

- Yes
- No

* 10. Do you have to be reminded to wash your hands and/or, use hand sanitizer when needed?

- Yes
- No
- Sometimes
- Most of the time

Hygiene Practices in Athletes

NATA Guideline #4

* 11. Do you shower after every practice and game?

- Yes
- No
- Sometimes

12. If you answered "yes" or "sometimes" for question #11, do you use antimicrobial soap when showering after every practice or game?

- Yes
- No
- Sometimes

* 13. After practice, or a game, which facility do you prefer to shower in?

- On-Campus Housing
- Family House
- Athletics' Locker Room
- Your Apartment

* 14. Have you ever felt the need to utilize cosmetic body shaving for performance enhancement purposes?

- Yes
- No
- Sometimes

* 15. How often do you clean your clothing for athletics?

- 1-2 days a week
- 3-4 days a week
- 5-7 days a week
- None of the above

16. If you answered "none of the above" to question #15, could you state a reason as to why your clothing for athletics is not getting cleaned frequently?

* 17. Who ensures that the clothing and equipment gets cleaned on a daily basis?

- Equipment Manager
- Team Manager
- Coaches
- No one ensures that these get cleaned on a daily basis.

Hygiene Practices in Athletes

NATA Guideline #5

* 18. Have you shared clothing with other athletes?

Yes

No

19. If you answered "yes" for question #18, how often did you all share clothing?

Once

Most of the time

On a daily basis

* 20. Do you routinely share towels with your fellow players?

Yes

No

21. If you answered "yes" for question #20, how often did you all share towels?

Once

Most of the time

On a daily basis

* 22. Do you routinely share athletic gear ?

Yes

No

23. If you answered "yes" for question #22, how often did you all share athletic gear?

- Once
- Most of the time
- On a daily basis

* 24. Do you share water bottles with your fellow players?

- Yes
- No

25. If you answered "yes" to question #24, how often did you all share water bottles?

- Once
- Most of the time
- On a daily basis

* 26. Do you routinely share disposable razors and/or hair clippers?

- Yes
- No

27. If you answered "yes" to question #26, how often do did you all share disposable razors and/or hair clippers?

- Once
- Most of the time
- On a daily basis

Hygiene Practices in Athletes

NATA Guideline #6

- * 28. Do you cover any cuts, scrapes, or abrasions before utilizing the ice baths when needed?
- Yes
- No
- * 29. Have you ever utilized a common warm, or cold, whirlpool with an uncovered open wound present on your skin?
- Yes
- No
- * 30. Are you instructed by your athletic trainer to cover open wounds before using whirlpools and common tubs?
- Yes
- No
- * 31. Have you witnessed other athletes utilize the common tub or whirlpool without covering an open cut, abrasion, or scrape before using it?
- Yes
- No
- * 32. Have you shared a common tub or whirlpool at the same time as any other teammate that had an uncovered, open skin wound?
- Yes
- No

Hygiene Practices in Athletes

NATA Guideline #7

* 33. Have you ever had a skin wound (i.e. cut, abrasions) while participating in collegiate sports?

- Yes
 No

34. If you answered "yes" for question #33, who managed the skin wound? Please check all that apply:

- Yourself
 The Athletic Trainer
 The On-Campus Health Center

* 35. If you managed your skin wound, what did you use to clean the wound?

- Alcohol swabs
 Hydrogen Peroxide
 Soap and Water
 None, I did not clean my wound when I had one.

* 36. How often do you clean a new and open wound?

- Once a day
 Twice a day
 Initially when I get the wound only
 I do not clean a new and open wound when I have one.

* 37. When you sustain a cut/open wound, do you cover your open wounds with a dressing, including band aids, gauze, cover roll, etc.?

- Yes
- No
- Sometimes

* 38. Do you report any minor cuts/wounds to your health care provider, including the athletic trainer, physician, health center, etc.?

- Yes
- No
- Sometimes

Hygiene Practices in Athletes

Barriers

- * 39. Are there hand sanitizer dispensers placed in your facility, for example your locker rooms?
- Yes
- No
- * 40. Are there showers available for you to use in your athletic facilities after practices or games?
- Yes
- No
- * 41. Are you expected to clean your own equipment?
- Yes
- No
- * 42. Can you locate where the first aid kit is in your athletic facility?
- Yes
- No
- * 43. Are wound care items, such as alcohol swabs, gauze pads, band aids, etc., available to you at all times when needed?
- Yes
- No

APPENDIX C2

Institutional Review Board -

California University of Pennsylvania



California University of Pennsylvania

Proposal Number

Date Received

IRB Review Request

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

Submit this form to instreviewboard@calu.edu or Campus Box #109

Project Title Student-Athlete Adherence to the National Athletic Trainers' Guidelines on Preventing Skin Diseases

Researcher/Project Director Lionel Rice

Phone # 347-657-4337

E-mail Address RIC8301@calu.edu

Faculty Sponsor (if researcher is student) Dr. Jodi Dusi

Department Health Science

Project Dates April 1st, 2016 to April 15th 2016

Sponsoring Agent (if applicable) N/A

Project to be Conducted at California University of Pennsylvania

Project Purpose: Thesis Research Class Project Other

Keep a copy of this form for your records.

Required IRB Training

All researchers must complete an approved Human Participants Protection training course. The training requirements can be satisfied by completing the CITY (Collaborative Institutional Training Initiative) online course at <http://www.citiprogram.org>. New users should affiliate with "California University of Pennsylvania" and select the "All Researchers Applying for IRB Approval" course option. A copy of your certification of training must be attached to this IRB Protocol. If you have completed the training in the past 3 years and have already provided documentation to the IRB, please provide the following:

Previous Project Title _____

Date of Previous Project IRB Approval _____

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. All items in the Review Request Checklist, (see below) must be addressed.*

This project is a descriptive study to investigate the adherence rates of student athletes participating in collegiate sports with the guidelines on prevention of skin diseases by the National Athletic Trainers' Association. The data will be collected via one anonymous online survey directed to student-athletes. This study is explorative, and as such there is no dependent variable. The subjects of the study include student athletes who are currently active in organized, collegiate level football, wrestling, soccer, baseball, softball, swimming, track and field, or lacrosse at California University of Pennsylvania, King's College, and Washington and Jefferson College. The link to the survey, entitled "Hygiene Practices in Athletes", will be emailed to the athletic trainers at California University of Pennsylvania, King's College, and Washington and Jefferson College who will then distribute the email to student-athletes. The survey will be open for two weeks, and after a two week period, the survey will close. At the midway point (1 week), the investigator will send a reminder email to the athletic trainers at the institutions previously mentioned to again forward to the respective student-athletes and coaches to encourage survey completion. The survey will be ultimately distributed to 909 student-athletes among the three participating schools. The first page of the survey will be the cover letter, followed by a page to ensure that all participants are at least 18 years of age. If a participant is not 18 years of age, the survey will close and no data will be collected from the participant. The hypothesis for this study is that the survey results will show that the student athletes are adherent to the NATA guidelines on Prevention of Skin Diseases thus, decreasing their chances of getting a skin disease. All responses will be anonymous and stored on a password protected university server. Statistical analysis will be completed using a commercially available software package (SPSS, Chicago, IL) and data will be analyzed using descriptive techniques. However, we will utilize the mean number between the subjects that are non-adherent and subjects that are adherent. This will be determined by observing the scores of the surveys. The survey will be scored on a point value system. There are 5 questions for each of the NATA guidelines being utilized in the survey and if the participant answers 3 of the 5 required questions correctly, then this will determine them as adherent to that specific guideline. This allows for an analysis of each guideline specifically.

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.*

The risks to the participants in this study are minimal due to the fact that participation is limited to the completion of a survey. All responses will be confidential. The survey results will be kept on password protected accounts, and once all data is collected it will be entered into an electronic spread sheet on a secure server. Subject participation is completely voluntary, as noted in the cover letter, and the subjects can end participation at any moment without any penalty.

- 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.*

The target population for this study are collegiate student athletes that are currently active at California University of Pennsylvania, King's College, and Washington and Jefferson College. The

sample is a sample of convenience. All participants in this survey must be at least 18 years of age. All participants must agree that they have read the cover letter and all must regard that they are at least 18 years of age. If a participant says they are not 18 years of age, they will not be allowed to continue in the survey. The cover letter assures each participant that their participation is completely voluntary and anonymous, and their participation can discontinue at any time without penalty.

- 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 upon the return of the survey, which is explained in the cover letter prior to the beginning of the survey. Each participant must note that they have read and understand the cover letter. Contact information for both the researcher and faculty advisor will be made available for all participants if any have questions or comments

- 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 survey was developed using Survey Monkey and all results are on a password protected account. Once all data is received, the results will be entered into a password protected electronic spread sheet and held on a secure server. Only the researcher and advisor will have access to the passwords to access this data. The survey itself contains demographic questions – pertaining to age, gender, years of experience playing a sport, and any other demographic but this is the extent of those questions. There are limited questions which would allow distinguishing the identity of subjects.

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

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

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.

If Yes, explain the debriefing process here.

7. *If your project involves a questionnaire or interview, ensure that it meets the requirements in the Survey/Interview/Questionnaire checklist.*

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 nn/nn/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 (Faculty/Staff) Research

Project Director's Signature

Student or Class Research

Leonel Rice

Project Director's Signature

Jan D. ... M.D.

Supervising Faculty Member'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

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Lionel Rice** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 06/21/2015

Certification Number: 1786779

**Institutional Review Board
California University of Pennsylvania
Morgan Hall, 310
250 University Avenue
California, PA 15419
instreviewboard@calu.edu**

Robert Skwarecki, Ph.D., CCC-SLP, Chair

Dear Mr. Rice:

Please consider this email as official notification that your proposal titled " Student-Athlete Adherence to the National Athletic Trainers' guidelines on preventing skin diseases" (Proposal #15-067) has been approved by the California University of Pennsylvania Institutional Review Board as amended with the following stipulation:

This study protocol is approved and data collection may begin immediately at/through California University of Pennsylvania. However, collection of data at other sites/facilities requires evidence of prior written permission from an appropriate authority (e.g. administrator, IRB, etc.) at that facility. Emails are acceptable as evidence of permission, but they must be obtained and forwarded to the CalU IRB before data is collected at that facility.

Once you have submitted written evidence of permission, you may immediately begin data collection. You do not need to wait for further IRB approval. At your earliest convenience, you must forward a copy of the changes for the Board's records.

The effective date of the approval is 03/30/2016 and the expiration date is 03/29/2017. These dates must appear on the consent form.

Please note that Federal Policy requires that you notify the IRB promptly regarding 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 03-29-2017 you must file additional information to be considered for

continuing review. Please contact instreviewboard@cup.edu. Please notify the Board when data collection is complete.

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

APPENDIX C3

Institutional Review Board -
Washington and Jefferson College

Institutional Review Board for Human Subjects Survey Approval Form

This form should be used to obtain approval from the Washington & Jefferson College Institutional Review Board for a survey or questionnaire intended to be administered to members of the college community; experiments or methodologies involving more than a simple survey must provide more detailed information than described here. In addition, note that this form is *not* appropriate to use if subject deception will be employed in your survey.

In addition to this completed and signed form, you should attach a copy of your survey along with any additional documents that you plan provide to the subjects.

Principle Investigator Name: Lionel Rice

Faculty Advisor Name (if applicable): Dr. Jodi Dusi

Title of Attached Survey: Hygiene Practices in Athletes

Approximate Starting and Ending Dates (pending approval): 4/1/16 to 4/15/16

1. What, in non-technical terms, is the objective in distributing this survey?

This project is a descriptive study to investigate the adherence rates of student athletes participating in collegiate sports with the guidelines on prevention of skin diseases by the National Athletic Trainers' Association (NATA). This is in terms of exploring the student-athletes' hygiene practices and skin infection management practices while participating in collegiate athletics. Another objective for this survey is to identify any barriers to implementation of these NATA guidelines on prevention of skin diseases. The data will be collected via one anonymous online survey directed to student-athletes. This study is explorative, and as such there is no dependent variable. The subjects of the study include student athletes who are currently active in organized, collegiate level football, wrestling, soccer, baseball, softball, swimming, track and field, or lacrosse at California University of Pennsylvania, King's College, and Washington and Jefferson College.

2. How will this survey be distributed and collected? How will subjects be selected? To how many subjects do you intend to distribute the survey?

The surveys will be distributed electronically via Survey Monkey. The target population for this study are collegiate student athletes that are currently enrolled at California University of Pennsylvania, King's College, and Washington and Jefferson College. The sample is a sample of convenience. All participants in this survey must be at least 18 years of age. All participants must agree that they have read the cover letter and all must regard that they are at least 18 years of age. I intend on distributing the survey 909 student-athletes among the three participating schools.

3. How will the subjects be informed that they may, without penalty, choose not to complete particular components of the survey or the survey as a whole?

If a participant says they are not 18 years of age, they will not be allowed to continue in the survey. The cover letter assures each participant that their participation is completely voluntary and anonymous, and their participation can discontinue at any time without penalty.

4. Will any personally identifying information be collected? If so, justify the collection of such information and explain how subject privacy will be maintained.

The survey itself contains demographic questions – pertaining to age, gender, years of experience playing a sport, and ANY OTHER DEMOGRAPHIC but this is the extent of those questions. There are limited questions which would allow distinguishing the identity of subjects.

5. Will any personally or psychologically sensitive information be collected? If so, justify the collection of such information and explain how subject privacy will be maintained.

No, there will not be any personal or psychological information collected from the subjects.

6. How will the overall confidentiality and privacy of the subject's responses be ensured? How will survey responses be handled and stored?

The survey was developed using Survey Monkey and all results are on a password protected account. Once all data is received, the results will be entered into a password protected electronic spread sheet and held on a secure server. Only the researcher and advisor will have access to the passwords to access this data.

7. Will there be a debriefing procedure or follow-up contact with the subject? If so, describe.

No, there will not be a debriefing or follow-up contact with the subjects.

Signature of Principle Investigator: Leonel Rice Date: 3/15/16

Signature of Faculty Advisor: John DeLuca MPT PhD Date: 3-16-16

Institutional Review Panel for Human Subjects Form

1. Title of proposed research.

Student-Athlete Adherence to the National Athletic Trainers' Guidelines on Preventing Skin Diseases

2. Please state the approximate dates for starting and ending this research project, after it has been approved.

4/1/16 to 4/15/16

3. Name of principle investigator. Students must also list names of faculty advisors.

Principle Investigator: Lionel Rice

Faculty Advisor: Dr. Jodi Dusi

4. State the purpose of the intended research, specifying the problems addressed, what is to be learned, and identify the specific objectives of the research.

This project is a descriptive study to investigate the adherence rates of student athletes participating in collegiate sports with the guidelines on prevention of skin diseases by the National Athletic Trainers' Association (NATA). This is in terms of exploring the student-athletes' hygiene practices and skin infection management practices while participating in collegiate athletics. Another objective for this survey is to identify any barriers to implementation of these NATA guidelines on prevention of skin diseases. These guidelines have shown the best possible ways to recognize, treat, and prevent different types of skin infections. As athletic trainers, we already have the knowledge of how to treat and prevent these types of disorders. We also already know how to recognize when an athlete has a skin disease. It is important for not only the health care professionals, but the participating athletes to be aware of and implement these guidelines. The reason why it's important for the athletes to follow these guidelines is because skin diseases occur amongst student athletes that play collegiate sports and it is looked at as a minor injury compared to others. It could occur within a contact or non-contact sport. At the conclusion of this research study, I hope to determine that student athletes are adhering to the NATA guidelines on prevention of skin diseases, thus decreasing their chances of getting a skin disease.

5. Describe in detail the procedures which will be used to achieve the objectives of the research project: include copies of any consent form, letters, survey forms or other applicable documentation. Describe any risks to the participants and how they will be minimized. Describe any potential benefits to the participants.

After the International Review Board approves of this research study, will take place for the student athletes. the survey will be distributed via Survey Monkey. The data will be collected via one anonymous online survey directed to student-athletes. This study is explorative, and as such there is no dependent variable. The subjects of the study include student athletes who are currently active in organized, collegiate level football, wrestling, soccer, baseball,

softball, swimming, track and field, or lacrosse at California University of Pennsylvania, King's College, and Washington and Jefferson College. The link to the survey, entitled "Hygiene Practices in Athletes", will be emailed to the athletic trainers at California University of Pennsylvania, King's College, and Washington and Jefferson College who will then distribute the email to student-athletes. The survey will be open for two weeks, and after a two week period, the survey will close. At the midway point (1 week), the investigator will send a reminder email to the athletic trainers at the institutions previously mentioned to again forward to the respective student-athletes and coaches to encourage survey completion. The survey will be ultimately distributed to 909 student-athletes among the three participating schools. The first page of the survey will be the cover letter, followed by a page to ensure that all participants are at least 18 years of age. If a participant is not 18 years of age, the survey will close and no data will be collected from the participant. The hypothesis for this study is that the survey results will show that the student athletes are adherent to the NATA guidelines on Prevention of Skin Diseases thus, decreasing their chances of getting a skin disease. All responses will be anonymous and stored on a password protected university server. Statistical analysis will be completed using a commercially available software package (SPSS, Chicago, IL) and data will be analyzed using descriptive techniques. However, we will utilize the mean number between the subjects that are non-adherent and subjects that are adherent. This will be determined by observing the scores of the surveys. The survey will be scored on a point value system. There are 5 questions for each of the NATA guidelines being utilized in the survey and if the participant answers 3 of the 5 required questions correctly, then this will determine them as adherent to that specific guideline. This allows for an analysis of each guideline specifically. 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. Completed surveys will not have any information that will allow you to be identified or allow for your data to be associated with you. Completed surveys will be kept on a password protected online databased until they are entered into a spreadsheet for data analysis after which they will be removed from the database. Electronic data will be stored in password-protected files on University servers. Minimal risk is posed by participating as a subject in this study.

6. Describe any debriefing procedure in detail.

No debriefing is needed for this research study.

7. How will the confidentiality of the participant's responses be guaranteed? What provisions are made for the storage of confidential material? Who has access to such material?

The risks to the participants in this study are minimal due to the fact that participation is limited to the completion of a survey. All responses will be confidential. The survey results will be kept on password protected accounts, and once all data is collected it will be entered into an electronic spread sheet on a secure server. Subject participation is completely voluntary, as noted in the cover letter, and the subjects can end participation at any moment without any penalty. Only the researcher and advisor will have access to the passwords to access this data.

8. Is there any deception or any other ethical issues involved in this study? If so, how does the knowledge gained justify the research?

There will not be any form of ethical issues or deception involved in this study.

9. Signature of the Investigator and (if student) the faculty advisor. Also indicate the date signed.

Signature of Principle Investigator: Lionel Rice Date signed: 3/15/16
Signature of Faculty Advisor: Jan Lisa M. Ph.D Date signed: 3-16-16

Washington & Jefferson College
Institutional Review Board

Approval Letter

Principle Investigator: Lionel Rice
Supervisor: Dr. Jodi Dusi
Approval Period: 3/30/2016 – 3/29/2017
Subject: Exempt Protocol
Protocol Number: CUP-2016S-040
Title: Student-Athlete Adherence to the National Athletic Trainers' Guidelines on Preventing Skin Disease.

The above referenced study has been reviewed by the Washington & Jefferson Institutional Review Board and has been designated exempt for the following cause:

Receipt of IRB approval of proposed protocol from California University of Pennsylvania, dated 03/30/2016. Approval certifies that potential risk is outweighed by expected benefits and adequate steps have been taken to assure the protection of human subjects.

Sincerely,

Lynn Wilson, IRB Chair

Letter sent by Lynn Wilson on 4/01/2016

APPENDIX C4
Institutional Review Board -
King's College



**KING'S
COLLEGE**
TRANSFORMATION. COMMUNITY. HOLY CROSS.

BIOLOGY DEPARTMENT

February 24, 2016

Dr. Jodi Dusi
California University of PA

Dr. Dr. Dusi;

This letter is in response to the request of Mr. Lionel W. Rice, who wishes to include athletes from King's College, Wilkes-Barre, PA as subjects in a research protocol he has, or will submit to the California University of PA Institutional Review Board (IRB) for approval.

As Chair of the King's College IRB, I indicated to Mr. Rice that we (IRB) would need to receive, (a) a copy of the approved research proposal and, (b) a copy of the official notification of approval from the California University of PA IRB before we could consider approval of the use of King's College athletes in the research. Usually, approval of the proposal from the IRB at the institution from which the request for student involvement is made, and provision of an official letter of approval from the IRB, will result in our (King's College IRB) approval for student involvement. The King's College IRB would also not require an additional, separate research proposal to be submitted to the King's College IRB.

I hope this clarifies the situation that currently is under discussion. If I may be of further assistance or if you need additional information, please let me know.

Sincerely;

Robert A. Paoletti, PhD
Professor of Biology
Chair, King's College IRB

Mr. Lionel Rice;

This letter is to inform you that we have received copies of your IRB research proposal to the IRB Committee at CalUof PA and associated documents, including the official notice of approval of the proposal from your IRB. Therefore, the IRB Committee at King's College grants you permission to solicit King's College student participation in your research as of this date, April 1, 2016.

Robert A. Paoletti, PhD

professor of Biology

Chair, King's College IRB Committee

APPENDIX C5

Cover Letter



**CALIFORNIA UNIVERSITY OF PA
ATHLETIC TRAINING**

Date: April 8, 2016

Dear Student-Athlete:

My name is Lionel Rice and I am currently a graduate student at California University of Pennsylvania performing thesis research. I am conducting survey research to determine if collegiate athletes are adhering to recommended measures identified by the National Athletic Trainers' (NATA) guidelines on the prevention of skin diseases in athletics. At the conclusion of this research, I hope to determine if athletes are increasing or decreasing their chances of getting a skin infection due to their level of adherence to the NATA guidelines on prevention of skin infections. The athletes will be asked to complete one survey during this research. The survey for the student-athletes consists of items addressing personal hygiene practice, athletic facility maintenance, their background experience with dermatological infections, and the hygiene of the athletic equipment being used.

You are being asked to participate due to your participation in collegiate level sports. Your participation is voluntary and you do have the right to choose to not complete this survey. 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 03/30/2016 and expires 03/29/2017.

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. Completed surveys will not have any information that will allow you to be identified or allow for your data to be associated with you. Completed surveys will be kept on a password protected online databased until they are entered into a spreadsheet for data analysis after which they will be removed from the database. Electronic data will be stored in password-protected files on University servers. 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 approximately 15 minutes to complete. If you have any questions regarding this project please feel free to contact the primary researcher, Lionel Rice, LAT, ATC, at RIC8301@calu.edu or 347-657-4337 or the faculty advisor Dr. Jodi Dusi, PhD, MPT, at dusi@calu.edu, or 724-938-4562.

I'd like to genuinely thank you for taking the time to take part in this research. Your time, thought and effort for completing this survey is greatly appreciated.

Sincerely,

Lionel Rice LAT, ATC
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
RIC8301@calu.edu
347-657-4337

APPENDIX D

National Athletic Trainer's Association Guidelines on
Prevention of Skin Diseases

Prevention

1. Organizational support must be adequate to limit the spread of infectious agents.
 - a. The administration must provide the necessary fiscal and human resources to maintain infection control.^{30,31} *Evidence Category: B*
 - b. Custodial staffing must be increased to provide the enhanced vigilance required for a comprehensive infection-control plan. *Evidence Category: C*
 - c. Adequate hygiene materials must be provided to the athletes, including antimicrobial liquid (not bar) soap in the shower and by all sinks.^{7,32-35} *Evidence Category: B*
 - d. Infection-control policies should be included in an institution's policies and procedures manuals.^{22,31,36-38} *Evidence Category: C*
 - e. Institutional leadership must hold employees accountable for adherence to recommended infection-control practices.^{8,30,39-43} *Evidence Category: B*
 - f. Athletic departments should contract with a team dermatologist to assist with diagnosis, treatment,

and implementation of infection control.⁴⁴ *Evidence Category: C*

2. A clean environment must be maintained in the athletic training facility, locker rooms, and all athletic venues.
 - a. Cleaning and disinfection is primarily important for frequently touched surfaces such as wrestling mats, treatment tables, locker room benches, and floors.^{9,10,45,46} *Evidence Category: A*
 - b. A detailed, documented cleaning schedule must be implemented for all areas within the infection-control program, and procedures should be reviewed regularly. *Evidence Category: C*
 - c. The type of disinfectant or detergent selected for routine cleaning should be registered with the Environmental Protection Agency, and the manufacturer's recommendations for amount, dilution, and contact time should be followed.^{10,31,47} *Evidence Category: B*

3. Health care practitioners and athletes should follow good hand hygiene practices.^{31,48}
 - a. When hands are visibly dirty, wash them with an acceptable antimicrobial cleanser from a liquid dispenser.^{48,49} *Evidence Category: A*
Correct hand-washing technique must be used, including wetting the hands first, applying the manufacturer's recommended amount of antimicrobial soap, rubbing the hands together vigorously for at least 15 seconds, rinsing the hands with water, and then drying them thoroughly with a disposable towel.⁴⁸ *Evidence Category: A*

- b. If hands are not visibly dirty, they can be decontaminated with an alcohol-based hand rub.^{17,18,41,50,51} *Evidence Category: B*
 - c. Hands should be decontaminated before and after touching the exposed skin of an athlete and after removing gloves.⁵²⁻⁵⁶ *Evidence Category: B*
4. Athletes must be encouraged to follow good overall hygiene practices.⁵⁷⁻⁵⁹
 - a. Athletes must shower after every practice and game with an antimicrobial soap and water over the entire body. It is preferable for the athletes to shower in the locker rooms provided by the athletic department.⁵⁷ *Evidence Category: B*
 - b. Athletes should refrain from cosmetic body shaving.²⁵ *Evidence Category: B*
 - c. Soiled clothing, including practice gear, undergarments, outerwear, and uniforms, must be laundered on a daily basis.¹⁰ *Evidence Category: B*
 - d. Equipment, including knee sleeves and braces, ankle braces, etc, should be disinfected in the manufacturer's recommended manner on a daily basis.⁵⁸ *Evidence Category: C*
5. Athletes must be discouraged from sharing towels, athletic gear, water bottles, disposable razors, and hair clippers.^{57,59} *Evidence Category: A*
6. Athletes with open wounds, scrapes, or scratches must avoid whirlpools and common tubs. *Evidence Category: C*
7. Athletes are encouraged to report all abrasions, cuts, and skin lesions to and to seek attention from an AT for proper cleansing, treatment, and dressing. *Evidence Category: C* All acute, uninfected wounds (eg, abrasions, blisters, lacerations) should be covered with a

semioclusive or occlusive dressing (eg, film, foam, hydrogel, or hydrocolloid) until healing is complete to prevent contamination from infected lesions, items, or surfaces. *Evidence Category: C*

APPENDIX E

NATA Guidelines #3-#7 and Survey Question Numbers

NATA Guidelines Reference	Survey Question Numbers
NATA Guideline #3: Health care practitioners and athletes should follow good hand hygiene practices.	*6 *7 *8 *9 *10
NATA Guideline #4: Athletes must be encouraged to follow good overall hygiene practices.	*11 12 *13 *14 *15 16 *17
NATA Guideline #5: Athletes must be discouraged from sharing towels, athletic gear, water bottles, disposable razors, and hair clippers.	*18 19 *20 21 *22 23 *24 25 *26 27
NATA Guideline #6: Athletes with open wounds, scrapes, or scratches must avoid whirlpools, and common tubs.	*28 *29 *30 *31 *32
NATA Guideline #7: Athletes are encouraged to report all abrasions, cuts, and skin lesions to and to seek attention from an AT for proper cleansing, treatment, and dressing.	*33 34 *35 *36 *37 *38

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ABSTRACT

TITLE: STUDENT-ATHLETE ADHERANCE TO THE NATIONAL ATHLETIC TRAINERS' GUIDELINES ON PREVENTING SKIN DISEASES

RESEARCHER: Lionel Rice LAT, ATC, NASM-PES

ADVISOR: Jodi Dusi, PhD, MPT

PURPOSE: The purpose of this study are to determine if collegiate athletes are adhering to recommended measures identified by the NATA guidelines on the prevention of skin disease and identify barriers to implementation of recommended measures.

DESIGN: This study was primarily a descriptive study.

METHODS: Student-athletes at California University of Pennsylvania, King's College, and Washington and Jefferson College participated in the Hygiene Practices in Athletes survey. It was composed by the primary researcher that is based off of the NATA Guidelines on Prevention of Skin Diseases. The survey was based on items #3 - #7 as these guidelines are applicable to student athletes. A panel of experts examined the survey and determined that it does demonstrate content validity. The survey asked questions related to hygiene practices and barriers to implementation of preventative measures. The survey was conducted electronically through Survey Monkey®. Participants: 117 subjects, 69 females and 48 males, who were at least 18 years old and enrolled at one of these three participating schools as student-athletes. Data was analyzed using descriptive techniques and an adherence level score through SPSS version 22.0 for windows.

RESULTS: Completed surveys concluded that majority of the student-athletes do adhere to the MATA Guidelines on Prevention of Skin Diseases. This hypothesis showed that a higher percentage of student-athletes were adhering to NATA guidelines #3-#7. Specifically, 68.4% were adherent to guideline #3, 52.1% were adherent to guideline #4, 95.7% were adherent to guideline #5, 88% were adherent to guideline #6, and 53% were adherent to guideline #7. Additional results were found for questions pertaining to barriers of implementation where a majority of student-athletes showed that they do not have any barriers to implement these recommended preventative measures set by the NATA. 71.1% reported that there are hand sanitizer dispenses located in the athletic facilities that are utilized, 81% reported that there are showers available in their athletic facilities to utilize after activity, 50.4% reported that they are not expected to clean their own athletic equipment, 75.6% reported that they can locate the first aid kit in their athletic facility, and 92.7% reported that they do have the proper wound care supplies available at all times when needed. Additional findings also related to supplemental questions to the sharing of specific items for guideline #5. These results showed a high percentage that the subjects who responded "yes" to these questions are sharing these items at least once with other athletes.

CONCLUSION: This study proved the hypothesis of student-athletes adhering to the NATA Guidelines on Prevention of Skin Diseases. The results also portrayed how there wasn't as many barriers present to implementation of these recommendations. Therefore, a high percentage of these student-athletes are not at risk of contracting a skin disease.

KEY WORDS: Skin Diseases, Prevention, NATA Guidelines