

The University of Maine

DigitalCommons@UMaine

Honors College

Spring 5-2022

Efficacy of the FIFA 11+ Injury Prevention Program in Maine High School Soccer

Meg Lander

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/honors>



Part of the [Educational Assessment, Evaluation, and Research Commons](#), and the [Sports Sciences Commons](#)

This Honors Thesis is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Honors College by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

EFFICACY OF THE FIFA 11+ INJURY PREVENTION PROGRAM IN MAINE HIGH
SCHOOL SOCCER

by

Meg Lander

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Athletic Training)

The Honors College

University of Maine

May 2022

Advisory Committee:

Christopher Nightingale, Associate Professor of Athletic Training and Physical
Education, Advisor

Mark Haggerty, Rezendes Preceptor for Civic Engagement

Alicia Lacy, Assistant Professor of Athletic Training

Sid Mitchell, Associate Professor of Education

Bryan Schopieray, Adjunct Instructor of Athletic Training

ABSTRACT

The purpose of this thesis was to assess the efficacy of the FIFA 11+ injury prevention program when used over the course of one soccer season in Maine high school athletics when compared to a standard warm-up approach. Every year, nearly two million injuries are sustained by high school athletes, and the FIFA 11+ program was developed to mitigate the risk of lower body injuries in soccer players. It has been shown to reduce the incidence of injury by one third or more in teenage and older athletes. Participants were randomly allocated into the FIFA 11+ group and the control group. The participants used their assigned warm-up program for the duration of their season. The results showed a statistically significant reduction in the number of injuries sustained by the FIFA 11+ group compared to the control group. The time lost due to injury was not statistically significant. The FIFA 11+ group suffered a total of 4 injuries with 97 days lost and the control group suffered 17 injuries resulting in 194 days lost. The four injuries sustained by the FIFA 11+ group were all serious and/or season ending while the control group sustained three serious and/or season ending injuries. The results suggest that the FIFA 11+ program may be effective in decreasing the incidence of mild to moderate injuries.

ACKNOWLEDGEMENTS

This work was made possible in part by the support of the Carolyn E. Reed Pre-Medical Thesis Fellowship.

TABLE OF CONTENTS

Introduction	1
Literature Review	3
Methods	9
Results	11
Discussion	13
Bibliography	17
Appendices	19
Appendix A: Informed Consent	20
Appendix B: Recruitment Email	22
Appendix C: IRB Approval	23
Author's Biography	24

LIST OF FIGURES

Table 1: Results	11
Table 2: Incidence of Body Part Injured	12

INTRODUCTION

Over seven million high school students participate in athletics each year and these athletes are sustaining nearly two million injuries per year (Darrow *et al.*, 2009), of which approximately 14.9 percent are considered to be severe. Darrow et al. found that in high school soccer, girls are more likely to sustain a severe injury than boys, although the results were not statistically significant. The rate of severe injury increased during competition compared to practices, especially for girls' soccer. The most common injuries sustained by soccer players occurred at the knee (38.9 percent) and ankle (16.0 percent), and nearly half of the injuries sustained by girls' soccer players were to the knee.

The FIFA 11+ program was developed in 2006 by the FIFA Medical Assessment and Research Centre to prevent injuries in teenage and older soccer players and has been shown to reduce lower body injuries by up to one third (Sadigursky *et al.*, 2017). The program focuses on agility skills such as changing direction, jumping, and landing. The program is twenty minutes long and starts with running exercises with cutting, changing direction, deceleration, and landing techniques. The second part focuses on core strength, plyometrics, proprioception, and eccentric control. The final part is more running exercises, but they are performed at a high-speed with changes of direction. Each part of the program can be progressed to accommodate the skill level of the athlete.

The knowledge of this program, and how to properly execute it, is not widely known and implemented. Many Eastern Maine high schools have only recently acquired an athletic trainer as part of their sports medicine team. Without the guidance of an athletic trainer, many coaches would not know about or how to implement an injury

prevention program. The purpose of this research is to evaluate the efficacy of the FIFA 11+ injury prevention program when used in Maine high school soccer, compared to standard approaches, over the course of one season.

LITERATURE REVIEW

Incidence of High School Athletic Injuries

Darrow *et al.* (2009) discuss the rate of incidence of injury in high school athletics. Darrow et al. used the High School Reporting Information Online surveillance system from 2005-2007 to collect data from 100 US high schools and found that boys have a higher incidence of injury than girls with 0.45 per 1000 exposures compared to 0.26, but the difference between boys' and girls' soccer was not statistically significant. Darrow *et al.* found the incidence of severe injury to be 0.39 per 1000 exposures or about 14.9% of all high school sports-related injuries with girls' soccer sustaining more severe injuries than boys' soccer. The incidence for girls' soccer was 0.33 per 1000 exposures. Injuries were more likely to be sustained during competition rather than practice. The authors found that the most commonly injured body parts were the knee and ankle. The most common diagnoses were fractures, complete ligament sprains, and incomplete ligament sprains comprising over 65% of all injuries.

Gornitzky *et al.* (2016) used a meta-analysis to study the incidence and yearly risk of ACL injury in high school sports. The authors found that girls had a higher rate of injury per exposure, while boys suffered more injuries. Soccer had the highest risk of injury per season for girls at 1.11% and for boys it was the third highest at 0.30%. The overall risk of ACL tears per exposure was 1.6-fold greater for girls than it was for boys.

The FIFA 11+ Injury Prevention Program

Thorborg *et al.* (2017) assessed the effectiveness of the FIFA 11 and FIFA 11+ programs in recreational/sub-elite soccer. The FIFA 11 program contained fewer

exercises than the FIFA 11+ (10 exercises compared to 15) and took 10-15 minutes compared to the FIFA 11+ taking 20 minutes. The FIFA 11+ program includes more running, cutting, and other exercises such as the single-leg stance exercises and adding squats. The authors analyzed 6 randomized control trials that used the FIFA 11 or FIFA 11+ program against a control. The authors found little to no injury reduction when studies used the FIFA 11 program against a control group but found the FIFA 11+ program reduced injuries by 39% compared to a control group. Thorborg *et al.* found no preventive effect using the FIFA 11 and recommended using the FIFA 11+ program instead.

Sadigursky *et al.* (2017) conducted their systematic review using the PRISMA Statement. The PRISMA Statement stands for the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. Six randomized control trials (RCTs) were selected with a total of 6344 players. The FIFA 11+ group had 23.6% of the players sustain injury and the control group had 40.1% of the players sustain injury. The authors found that the FIFA 11+ warm-up program reduced lower body injuries by 30% in soccer players. The RCTs had a player population ranging from 13 to over 40 years old, so Sadigursky *et al.* concluded that the FIFA 11+ program is effective in reducing the injury rate in soccer players over the age of 13 ($p = 0.01$).

Steffen *et al.* (2013) used a cluster-randomized control trial to examine the effects of program adherence on injury prevention with the FIFA 11+ program in 13–18-year-old female soccer players. 383 players from 29 teams were allocated into three groups: control, regular, and comprehensive. According to Steffen *et al.*, there was no statistical significance between the groups adherence and where they received the information

about the FIFA 11+ (uncontrolled website, coach-focused workshop with or without supervision of a physiotherapist) (IRR=0.44, 95% CI 0.18 to 1.06). When comparing the players with low adherence to high adherence, those with higher adherence had a 56% decreased risk for all injuries and 48% decreased risk for lower extremity injury.

Silvers-Granelli *et al.* (2017) used a prospective cluster randomized control trial of 61 Division I and II NCAA men's soccer programs to examine whether the FIFA 11+ program would reduce the number of ACL injuries sustained and whether field position, playing surface, level of play, and competition versus practice make a difference. The authors found a 4.25-fold reduction in ACL injuries in the intervention group (3 of 19 ACL injuries) compared to the control group (16 of 19 ACL injuries). There was no difference in the incidence of ACL injuries between training and competition or player position. There was a higher incidence of injury in the control group when the players played on artificial turf versus natural grass and Silvers-Granelli *et al.* found no difference in Division I treatment and control groups, but the Division II treatment group had fewer ACL injuries compared to the control group. The authors suggest that this is because of the difference in intensity of play and overall skill level.

Barengo *et al.* (2014) performed a systematic review of 12 research studies from 10 different countries on the FIFA 11+ program and found that when the FIFA 11+ program was implemented with male and female athletes, between 30-70% fewer injuries were sustained and when there was high compliance a 35% injury reduction was seen as well as improved neuromuscular performance and motor control. The studies that focused on 13–18-year-old female soccer players found up to a 57% percent reduction in injury incidence when the players were compliant. One study only used the FIFA 11+ once per

week for eight months and did not find a statistical difference in the incidence of injury (Steffen *et al.*, 2008). Barengo *et al.* state that compliance is a major component of the effectiveness of the program, along with ensuring that coaches are taught how to implement the program properly and that they use the program consistently is important.

The effect of FIFA 11+ program adherence was also researched by Bizzini and Dvorak (2015) and McKay *et al.* (2014). Bizzini and Dvorak used a narrative review of 25 research studies, where the evidence suggests that the implementation of the FIFA 11+ program in male and female amateur footballers aged 13-18 years old is beneficial. This study also found that when the FIFA 11+ program is implemented with high adherence, it can prevent injuries. It was also noted that strong commitment from soccer organizations is key to the program's success. McKay *et al.* used a randomized control trial of 31 female soccer teams to assess the team's knowledge and beliefs about injury prevention and found that there were gaps in the participants knowledge regarding injury prevention and injury risk factors between the coaches and players, but these factors did not influence program adherence. McKay *et al.* did find that the longer the coach or athlete had been in the sport, the less likely they were to adhere to the new program implantation.

The Effect of the Playing Surface. Since the introduction of artificial turf in the 1960's, athletes, coaches, and medical professionals have debated whether it has led to an increased risk for injury. Drakos (2008) discusses the impact of different artificial turf surfaces on sports-related injury rate. He found that medical professionals have seen an uptick in injuries including ACL tears, concussions, ankle sprains, and muscle soreness

since the 1960's. Drakos discusses how the coefficient of friction and the coefficient of restitution can affect injury rate, increasing the “stickiness” of the surface and its ability to absorb shock respectively. These are important to consider because artificial turf is typically made of nylon or polyethylene fibers with rubber mixed with sand used to simulate dirt, but there are not set standards for these turfs and each manufacturer will make the turf a little different. Drakos also mentions that a poorly maintained grass field can increase the risk for injury and that areas in the north are more likely to have poor field conditions due to the weather. Drakos states that the best conditions to decrease injury risk have yet to be determined due to these factors.

Howard *et al.* (2020) used the NCAA Injury Surveillance System database to find the incidence rate of ACL injury in male and female athletes from 2004-2014 on natural grass and artificial turf. The authors found that athletes were 8.67 times more likely to suffer an ACL injury during practice on natural grass compared to artificial turf. Howard *et al.* found no difference in ACL injuries sustained on the different surfaces during competition. This increased risk was not affected by sex or NCAA division of play.

In Williams' *et al.* (2013) meta-analysis of soccer injuries sustained on artificial turf versus natural grass, they did not find an increased risk for injury on artificial turf. The authors used studies that focused on competitive soccer players with acute injuries that played on both natural grass and artificial turf. Williams *et al.* did not include any research where one surface type was used exclusively. Of the total exposure hours, 34.5% was spent on artificial turf and 65.5% was spent on natural grass. Between the studies there were a total of 9737 injuries with 27.4% occurring on artificial turf and 72.6% occurring on natural grass. Williams *et al.* claim that playing on artificial turf does not

increase the risk of injury and may even result in fewer injuries sustained under some conditions.

METHODS

A convenience sample of three local high school women's soccer programs were recruited based on the information provided on the respective high schools' athletics website. At the start of the study, participants were randomly allocated into FIFA 11+ or control groups via a coin flip. 35 subjects were assigned to the FIFA 11+ program group from two schools and 36 subjects were assigned to the control group from one different school. Coaches and athletic trainers (AT) were provided with informed consent documents (see Appendix A). Coaches and ATs in the FIFA 11+ program group were then instructed by the primary investigator on how to implement the FIFA 11+ program as their warm-up. They were shown each exercise in the program and given the FIFA 11+ program poster and were sent videos of the exercises to refer to if needed during the season. Coaches and ATs were instructed to use the FIFA 11+ program before every practice and game for the duration of the soccer season. Coaches and ATs in the control group were instructed to continue using the normal warm-up program they had been using already. The participants were blinded to the nature of the study.

The investigator performed check-ins with the coaches and ATs using the FIFA 11+ program randomly during the season to ensure adherence. This was done by the primary investigator attending a practice or game to observe the use of the program and make sure that it was being performed properly and to completion. Throughout the season, the school's ATs anonymously tracked any injury sustained by the athletes that caused the athlete to miss at least one practice and/or game and reported these injuries to the investigator at the end of the season. The ATs tracked the number of injuries severe enough that the athlete missed at least one practice and/or game, what body part was

injured (ankle, knee, hip etc.), the total amount of time lost due to the injury, when in the season the injury occurred, and whether it was during a practice or a game. This data was used in independent means t-tests for statistical analysis to assess for significant differences between the control and FIFA 11+ program groups for injuries sustained and days lost to injury. An odds ratio and confidence interval were also computed to measure the association of injury incidence to exposure. The analysis was done using a personal computer and the SPSS software (version 28.0).

RESULTS

The FIFA 11+ group sustained a total of 4 injuries, all occurring during competition, resulting in a total of 97 days lost. The control group sustained a total of 17 injuries, 11 of which occurred during competition and 6 during practice, resulting in 194 days lost. The results of this study showed a significant ($p < 0.05$) reduction in the number of injuries sustained when using the FIFA 11+ program ($t = -3.54, p = 0.00036$) though the reduction in amount of time lost due to injury was not statistically significant ($t = 1.48, p = 0.077$). Using an odds ratio test, the control group had a 6.9 times more likely chance to sustain an injury compared to the FIFA 11+ group (OR = 0.144, 95% CI [0.042, 0.493]).

Table 1: Results

	Participants	Season Ending Injuries	Injuries Sustained	Days Lost to Injury
FIFA 11+	35	3	4	97
Control	36	3	17	194
P-value			< 0.001*	0.077

*Significant at $p < 0.05$.

The most commonly injured body part among both groups was the knee (33.3%) followed by the ankle (23.8%). In the FIFA 11+ group, 75% of the injuries were to the knee and 25% to the ankle. In the control group, the knee and the ankle accounted for 4 injuries a piece (23.5%), while the hip/thigh accounted for another 3 (17.6%).

Table 2: Incidence of Body Part Injured

Body Part Injured	FIFA 11+ Group	Control Group	Number of Injuries	Percent of Total Injuries
Hip/Thigh	0	3	3	14.3
Knee	3	4	7	33.3
Lower Leg	0	2	2	9.5
Ankle	1	4	5	23.8
Foot	0	2	2	9.5
Thorax	0	1	1	4.8
Head	0	1	1	4.8
Total	4	17	21	100

DISCUSSION

The data shows a statistically significant reduction in the number of injuries sustained when using the FIFA 11+ program which is in line with previous trials discussed in the literature. The four injuries that were sustained by the FIFA 11+ group were all serious or season ending, resulting in 97 days lost while the control group suffered more minor injuries resulting in 74 days lost, alongside three season ending injuries (120 days lost) which all occurred during competition. Of the season ending injuries in both groups, all but one resulted in less than 30 days lost to injury. One season ending injury occurred at the end of the season, but was serious, and resulted in just the one day lost. The other serious injury in the FIFA 11+ group resulted in 18 days lost due to injury. In the control group, no other injury resulted in more than 14 days lost during the season and were all mild or moderate severity. The time lost due to injury was not statistically significant between the two groups. These results suggest that the FIFA 11+ program may be effective in decreasing the incidence of mild to moderate injuries. The results from this study are congruent with those found in the literature. When the FIFA 11+ program is implemented with female soccer players aged 13-18 years old, there may be a reduction in the incidence of lower body injuries.

The benefits of the FIFA 11+ program come in the increased neuromuscular development of the athletes using it. Young athletes may not have had proper training specific to soccer – how to move and adjust their body properly to react to different situations – and most young athletes favor their dominant side and do not focus on training their nondominant, so muscle imbalances occur. The FIFA 11+ program aids in this development and can address any limb asymmetry the player may have developed

from improper training. The exercises in the FIFA 11+ program aid in training the neuromuscular pathways which to increased muscular strength, speed, agility, balance, and proprioception which all aid in proper body movement and can lead to a decreased risk of injury.

The participants in the study were adherent to the group they were assigned. This was assured during the check-ins by the primary investigator throughout the entire season. Research done by Steffen *et al.* (2013) and Barengo *et al.* (2014) showed a greater reduction in the incidence of injury when participants had stronger program adherence. The data collected in this study is congruent with Steffen *et al.* and Barengo *et al.* with the participants having high adherence to the assigned program and finding a reduction in injuries. This suggests that stronger adherence leads to increased neuromuscular development because of the program is being used consistently which in turn may decrease the incidence of injuries sustained by players.

While the FIFA 11+ group followed a set warm-up program, the control group participants were not given a specific warm-up program to do before practices and competitions, so there may be some variability in the extent of the warm-up performed. The warm-up programs could vary in the exercises included and the duration of the program. They could include static and/or dynamic stretching as well as running/jogging exercises and could last any duration of time. Some of the exercises could also be the same or similar to those used in the FIFA 11+ program. These factors could affect the incidence of injury within the control group.

Differences between the groups could be due to variables in the level of play, the playing surface, and the small sample size. Having a small sample size increases the

likelihood for significant interaction between variables and any potential outliers have a greater effect on the results. The participants were made up of teams from both Class A and B schools and varsity and junior varsity players. Class A schools have a larger student body size and tend to play at a more competitive level than their Class B counterparts. Also, varsity players tend to be more skilled and play at a more competitive level compared to junior varsity players. The surface the participants played on was not restricted, participants might have played on artificial turf and/or natural grass for differing games and practices. This could lead to an altered risk of injury as Howard *et al.* (2020) and Williams *et al.* (2013) discuss the rate of injury on each surface is different, with artificial turf showing a lower risk of injury. Drakos mentions that since artificial turf has been implemented, new injuries, such as turf burn and turf toe, as well as increased frequency in ACL tears, concussions, ankle sprains, and muscle soreness, have been seen by coaches, athletes, and healthcare providers. While not all injuries are as common on artificial turf, there is still a risk to playing on both surfaces.

Another consideration is that the data collected by the AT's may be skewed due to a potential lack of athlete reporting and the access the athletes had to the school's AT. Not every school has an AT at the school during the day or team practice times, so they rely on the athletes to self-report injuries and be honest. Also, this means athletes could return to play sooner than the AT may think because the AT may not supervise every practice, so the time lost due to injury is based on the AT's best knowledge.

Going forward, I would recommend repeating the research with a larger sample size and to control variables such as playing surface, level of play, and access to an athletic trainer while maintaining strong program adherence by the participants. Other

variables to consider would be the prevalence of knee, hip, ankle, and/or foot injuries while using the FIFA 11+ program and the geographic area where the program is implemented as there may be differences in the program effectiveness depending on the circumstance in which it is used. Another aspect to consider would be the effect of playing surface. Since the playing surface of the two groups was variable, examining on which surfaces injuries occurred as well as under what circumstances (practice or competition) would be beneficial for future research.

BIBLIOGRAPHY

- Barengo, N. C., Meneses-Echávez, J. F., Ramírez-Vélez, R., Cohen, D. D., Tovar, G., & Bautista, J. E. (2014). The impact of the FIFA 11+ training program on injury prevention in football players: a systematic review. *International journal of environmental research and public health*, *11*(11), 11986–12000.
<https://doi.org/10.3390/ijerph111111986>
- Bizzini, M. and Dvorak, J. (2015). FIFA 11+: an effective programme to prevent football injuries in various player groups worldwide – a narrative review. *British journal of sports medicine*, *49*(577-579). 10.1136/bjsports-2015-094765
- Darrow, C. J., Collins, C. L., Yard, E. E., & Comstock, R. D. (2009). Epidemiology of severe injuries among United States high school athletes: 2005-2007. *The American journal of sports medicine*, *37*(9), 1798–1805.
<https://doi.org/10.1177/0363546509333015>
- Drakos, M. (2008). Artificial turf; does it increase the risk of sports injury?. Hospital for Special Surgery. https://www.hss.edu/conditions_artificial-turf-sports-injury-prevention.asp
- Gee A. O. (2017). Does the FIFA 11+ Injury Prevention Program Reduce the Incidence of ACL Injury in Male Soccer Players?. *Clinical orthopaedics and related research*, *475*(10), 2456–2458. <https://doi.org/10.1007/s11999-017-5412-8>
- Gornitzky, A. L., Lott, A., Yellin, J. L., Fabricant, P. D., Lawrence, J. T., & Ganley, T. J. (2016). Sport-Specific Yearly Risk and Incidence of Anterior Cruciate Ligament Tears in High School Athletes: A Systematic Review and Meta-analysis. *The American journal of sports medicine*, *44*(10), 2716–2723.
<https://doi.org/10.1177/0363546515617742>
- Howard, M., Solaru, S., Kang, H. P., Bolia, I. K., Hatch, G., Tibone, J. E., Gamradt, S. C., & Weber, A. E. (2020). Epidemiology of anterior cruciate ligament injury on natural grass versus artificial turf in soccer: 10-year data from the national collegiate athletic association injury surveillance system. *Orthopaedic journal of sports medicine*, *8*(7), 2325967120934434.
<https://doi.org/10.1177/2325967120934434>
- McKay, C.D., Steffen, K., Romiti, M., et al. (2014). The effect of coach and player injury knowledge, attitudes and beliefs on adherence to the FIFA 11+ programme in female youth soccer. *British Journal of Sports Medicine*, *48*, 1281-1286.
DOI: 10.1136/bjsports-2014-093543

- Sadigursky, D., Braid, J.A., De Lira, D.N.L. et al. (2017). The FIFA 11+ injury prevention program for soccer players: a systematic review. *BMC Sports Sci Med Rehabil* 9, 18. <https://doi.org/10.1186/s13102-017-0083-z>
- Silvers-Granelli, H. J., Bizzini, M., Arundale, A., Mandelbaum, B. R., & Snyder-Mackler, L. (2017). Does the FIFA 11+ Injury Prevention Program Reduce the Incidence of ACL Injury in Male Soccer Players?. *Clinical orthopaedics and related research*, 475(10), 2447–2455. <https://doi.org/10.1007/s11999-017-5342-5>
- Steffen, K., Meeuwisse, W., Romiti, M., Kang, J., McKay, C., Bizzini, M., Dvorak, J., Finsch, C., Myklebust, G., & Emery, C. (2013) Evaluation of how different implementation strategies of an injury prevention programme (FIFA 11+) impact team adherence and injury risk in Canadian female youth football players: A cluster-randomized trial. *British Journal of Sports Medicine*. 47. 10.1136/bjsports-2012-091887.
- Steffen, K., Myklebust, G., Olsen, O. E., Holme, I., & Bahr, R. (2008). Preventing injuries in female youth football – A cluster-randomized controlled trial. *Scandinavian Journal of Medicine & Science in Sports*, 18, 605-614.
- Thorborg, K., Krommes, K. K., Esteve, E., Clausen, M. B., Bartels, E. M., & Rathleff, M. S. (2017). Effect of specific exercise-based football injury prevention programmes on the overall injury rate in football: a systematic review and meta-analysis of the FIFA 11 and 11+ programmes. *British journal of sports medicine*, 51(7), 562–571. <https://doi.org/10.1136/bjsports-2016-097066>
- Williams, J. H., Akogyrem, E., & Williams, J. R. (2013). A meta-analysis of soccer injuries on artificial turf and natural grass. *Journal of sports medicine (Hindawi Publishing Corporation)*, 2013, 380523. <https://doi.org/10.1155/2013/380523>

APPENDICIES

APPENDIX A

Informed Consent

You are invited to participate in a research project being conducted by Meg Lander, an undergraduate student in the Department of Kinesiology, Physical Education, and Athletic Training at the University of Maine. The faculty advisor is Dr. Christopher Nightingale, Associate Professor of Physical Education and Athletic Training, College of Education and Human Development at the University of Maine. The purpose of the research is to assess the efficacy of the FIFA 11+ injury prevention program over the course of one high school soccer season. You must be 18 years or older to participate.

What Will You Be Asked to Do?

If you decide to participate, you will be asked to use either the FIFA 11+ program or the warm-up you have previously used prior to each practice and competition and report any injuries sustained during the season to the primary investigator. Participation will take the entire season. The primary investigator will also conduct check-ins every three weeks throughout the season to ensure that you are complying with your assigned warm-up program. You will also be asked to track and submit any injuries that cause the athlete to miss at least one practice and/or game sustained during the soccer season to the primary investigator at the conclusion of your season. The athletic trainers will track the number of injuries severe enough that the athlete missed at least one practice and/or game, what body part was injured (ankle, knee, hip etc.), the total amount of time lost due to the injury, when in the season the injury occurred, and whether it was during a practice or a game

Risks

Except for your time and inconvenience, there are no risks to you from participating in this study.

Benefits

While this study may or may not have any direct benefit to you, this research may help us learn more about the efficacy of the FIFA 11+ program compared to standard approaches over one season.

Confidentiality

The athlete's name will not be on any of the data. Data will be kept on a password protected computer and kept until May 7, 2023. Faculty advisor Dr. Christopher

Nightingale will also have access to the data. The participant's name, age, and high school will not be reported in any publications.

Contact Information

If you have any questions about this study, please contact me at mary.lander@maine.edu. You may also reach the faculty advisor on this study at christopher.nightingale@maine.edu. If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine, 207/581-2657 (or e-mail umric@maine.edu).

APPENDIX B

Recruitment Email

Dear _____,

My name is Meg Lander and I am a third year Honors student at the University of Maine. As an Honors student, I have to complete an honors thesis for my degree. For my thesis, I am researching the FIFA 11+ program and whether there is a difference in the amount of injuries sustained in high school soccer over the course of one season. Based on [high school name]'s athletic website, you are the school's athletic trainer and I am wondering if you and your soccer coaches would be interested in being a part of my research.

The FIFA 11+ program has been shown to reduce the amount and severity of injuries suffered by athletes, specifically to the lower body. The program focuses on agility skills such as changing direction, jumping, and landing. The program is twenty minutes long and starts with running exercises with cutting, changing direction, deceleration, and landing techniques. The second part focuses on core strength, plyometrics, proprioception, and eccentric control. The final part is more running exercises but they are performed at a high-speed with changes of direction. Each part of the program can be progressed to accommodate the skill level of the athlete.

The research would pose no risk to you or your teams besides time and convenience and may be very beneficial. If you are interested in participating in the study, the consent form is attached, or have any questions, please contact me.

Thank you,

Meg Lander

APPENDIX C

APPLICATION COVER PAGE

- **KEEP THIS PAGE AS ONE PAGE – DO NOT CHANGE MARGINS/FONTS!!!!!!!!!!**
- **PLEASE SUBMIT THIS PAGE AS WORD DOCUMENT**

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
 Protection of Human Subjects Review Board, 400 Corbett Hall

(Type inside gray areas)

PRINCIPAL INVESTIGATOR: Mary Lander EMAIL: mary.lander@maine.edu
 CO-INVESTIGATOR: EMAIL:
 CO-INVESTIGATOR: EMAIL:
 FACULTY SPONSOR: Christopher Nightingale EMAIL: Christopher.nightingale@maine.edu
 (Required if PI is a student):
 TITLE OF PROJECT: Efficacy of the FIFA 11+ Program in Maine High School Soccer
 START DATE: 8.1.2021 PI DEPARTMENT: School of KPEAT

STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE U (F,S,G,U)

If PI is a student, is this research to be performed:

- | | | | |
|-------------------------------------|--|--------------------------|------------------------|
| <input checked="" type="checkbox"/> | for an honors thesis/senior thesis/capstone? | <input type="checkbox"/> | for a master's thesis? |
| <input type="checkbox"/> | for a doctoral dissertation? | <input type="checkbox"/> | for a course project? |
| <input type="checkbox"/> | other (specify) | | |

Submitting the application indicates the principal investigator's agreement to abide by the responsibilities outlined in [Section I.E. of the Policies and Procedures for the Protection of Human Subjects](#).

Faculty Sponsors are responsible for oversight of research conducted by their students. The Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research. **REMINDER:** if the principal investigator is an undergraduate student, the Faculty Sponsor MUST submit the application to the IRB.

Email this cover page and complete application to UMRIC@maine.edu

FOR IRB USE ONLY Application # 2021-05-08 Review (F/E): E Expedited Category:
ACTION TAKEN:

- Judged Exempt; category 3 Modifications required? Yes Accepted (date) 6/9/2021
- Approved as submitted. Date of next review: by Degree of Risk:
- Approved pending modifications. Date of next review: by Degree of Risk:
- Modifications accepted (date):
- Not approved (see attached statement)
- Judged not research with human subjects

FINAL APPROVAL TO BEGIN 6/9/2021
 Date

10/2018

AUTHOR'S BIOGRAPHY

Meg Lander was born in Bangor, Maine in September 1999. She grew up in Orrington, Maine and graduated from John Bapst Memorial High School in Bangor in 2018. Meg has always been involved in athletics. She was a varsity athlete at John Bapst playing soccer, basketball, and softball and a lifelong Black Bear fan, attending many UMaine hockey, basketball, and soccer competitions growing up. At the University of Maine, Meg majored in Athletic Training and was president of the Athletic Training Student Organization. After graduation, she plans on attending graduate school in hopes of one day attending medical school.