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## Psychosocial Indicators of Injury Concealment Among Young Male Athletes

Guillermo Alfonso

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PSYCHOSOCIAL INDICATORS OF INJURY CONCEALMENT AMONG YOUNG MALE  
ATHLETES

by

GUILLERMO ALFONSO

A thesis submitted in partial fulfillment of the requirements  
for Honors in the Major Program in Health Sciences Pre-Clinical  
in the College of Health and Public Affairs  
and in the Burnett Honors College  
at the University of Central Florida  
Orlando, Florida

Spring Term 2015

Thesis Chair: Michael J. Rovito, PhD, CHES, FMHI

## **Abstract**

The intent of this thesis is to explore the reasons why young athletes may conceal their sports injuries. In recent years, there has been much discussion about the long-term health implications that former athletes are dealing with as they live life after sports. Sports injuries including concussions, knee damage, and spinal injuries are all issues that could affect an athlete's quality of life far beyond their playing days. It is well known around the athletic and medical communities that many athletes withhold information about their injury symptoms just to get back on to the field. Most worrisome about this fact, is the disregard of any long-term damage being done to their body.

In this study, we explored the influence of social norms, perceived masculinity, and other external influences on athlete populations in an attempt to understand the reasons why injuries are so often under-reported and masked by athletes. Understanding the logic behind why athletes "play through" injuries and the external influences that may cause this behavior, is essential to athlete safety in the future. Results showed significant findings among highly masculine athletes and injury concealment as well as in athletes who feared losing a performance role and injury concealment. Those athletes who wish to appear tough and masculine as well as those athletes who may be fearful of losing a performance role were more likely to conceal their injuries. Athletes who are a part of a team were also likely to behave in the same way and understanding these reasons can help improve athlete safety in the years to come.

## **Acknowledgements**

I would like to thank my thesis chair and mentor Dr. Rovito for all of the help and guidance he has provided during this project and throughout my time at the University of Central Florida. I would also like to thank my entire committee for being a part of this work and helping me along the way.

I would also like to thank my parents for making me the man I am today. You have instilled in me knowledge and integrity, and without you, none of this would be possible.

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## **Introduction**

In recent years, there has been much discussion about the long-term health implications that former athletes are dealing with as they live life after sports. Injuries are encountered that have the potential to affect an athlete's quality of life far beyond their playing days, and the amount of these injuries are at an all-time high. The severity of this issue is shown by Lincoln et al. (2011) when they state that among high school athletes "the concussion rate increased 4.2-fold over the last 11 years" (p. 958-963). Adding to the problem, it is known around the athletic and medical communities that many athletes withhold information in regards to their injury symptoms, just to get back on to the field and thus disregard any long-term damage being done to their body.

This study explored the influence of social norms, perceived appearance/masculinity, and other external influences on young male athlete populations in an attempt to understand the reasons why athletic injuries may be underreported. By finding out the specific reasons why athletes mask their injuries, improvements can be made to injury diagnosis methods which could lead to improved athlete longevity.

## **Purpose and Importance**

There is a need in sports culture to understand athlete mentality in regards to ignoring and playing through injuries. This is demonstrated by the current media reports on athlete morbidity and mortality after their playing days. Understanding the underlying reasons why

injury concealment is present is an essential part of improving an athlete's quality of life after their playing days have finished. This research attempts to explain this behavior in order to allow athletes, coaches, and medical personnel, to work more closely together and better diagnose injuries that may have previously gone unnoticed. By doing this, it is our hope that athlete safety and longevity can be significantly improved, as understanding the reasons why athletes may withhold critical diagnosing information from medical professionals can be helpful in improving the health of these young athletes.

As a part of this study, psychosocial factors such as perceived appearance/masculinity, vulnerability, fear of losing a performance role, team influence, and overall injury awareness were hypothesized to be possible reasons contributing to injury concealment among young male athletes. More specifically;

H1: Athletes who perceive themselves as more masculine will tend to conceal injuries more than less masculine athletes.

H2: Athletes who play a team sport and feel a stronger sense of commitment to their teammates are also more likely to conceal their injuries and play on.

H3: Athletes who are fearful of losing a performance role or position on a team are more likely to conceal their injuries.

H4: Athletes who have a high level of injury ramification awareness are less likely to conceal injuries than athletes who have less injury ramification awareness.

These hypotheses were tested with the end goal being to understand the specific reasons why athletes often conceal their sport related injuries and ignore the long-term consequences which may be detrimental to their health.

## **Background**

### **Incidence and Prevalence of Athletic Injuries**

Various injuries that can have a significant negative impact on long-term health may be sustained during an athlete's career. There has been a rapid increase in incidence for many sport related injuries, which has consequently led to long-term health complications among athletes (Langlois et al. 2006). Further, Langlois et al. (2006) reveals that concussions alone currently "have an estimated occurrence of 1.6 – 3.8 million in the United States of America alone" (p. 375 – 376). Centers for Disease Control in the Morbidity and Mortality Weekly Report adds to this when they state that young athletes who participate in high school sports are very likely to get injured; there have been an estimated 1.4 million injuries at a rate of 2.4 injuries per 1,000 athletic exposures. Knowles et al. (2006) confirmed these statistics and also added that young boys have a 33% increased risk of getting injured while playing a sport than their female counterparts. The increased risk among males is alarming and may be due to several reasons such as increased physicality among male athletes or the promotion of masculine behavior in male sports (Anderson et al. 2012).

Another common misunderstanding is that many believe that only high contact sport athletes such as football players have serious injury risks and potential long term negative health outcomes. A study by Messina et al. (1999) surveyed approximately one thousand male basketball players and over 50% indicated they had an injury at some point during the prior season that affected them. Messina et al. (1999) went on to explain that the more common

injuries among the male population were lacerations and contusions and that more physical play among these athletes may be to blame. The prevalence of male athletes being injured more was looked at again by Peck et al. (2013) when both female and male rugby players were looked at in attempt to compare injury rates between the two groups. The results showed that males had a 30% higher chance of getting injured when participating in the exact same sport. This trend of male athletes becoming injured during athletic events is a cause for concern.

As sports evolve and athletes become bigger and stronger, athletic injuries are simply inevitable. According to Caine et al. (2008), several intrinsic and extrinsic factors contribute to the increasing rate of injuries, meaning that there are individual biologic and psychosocial influences predisposing an athlete to these injuries. These issues among others need to be better understood in order to better improve athlete safety in the future.

### **Injury Concealment**

While it is commonly accepted that risk factors lead to sports injuries, it is more concerning that athletes are ignoring and/or hiding symptoms in order to return to play despite their awareness of both the cognitive and physical repercussions (Kaut et al. 2003). Injuries that are overlooked or ignored in order for an athlete to return to play quicker are jeopardizing the long term health of that athlete and serious consequences may be observed long after that athlete's playing days have been completed. More alarming evidence of injury concealment was shown when Williamson and Goodman (2005) stated that among youth ice hockey players, concussions were significantly underreported by not only the players themselves but also by

the coaches and other team personnel. This idea was supported by Yard et al. (2009) when they stated that athletic trainers are significantly more likely to report injuries than coaches are.

The effects of injuries such as concussions on an athlete's quality of life in later years has been studied recently as well. De Beaumont et al. (2007) showed the long term effects that these injuries have on an athlete by finding that athletes with multiple concussions compared to one or no recorded concussions have significant cognitive impairment as they continue living their life. In reality, the best medical practices in the world are of no help if an athlete is dishonest with regard to the state of his or her health. High profile professional athletes have been quoted saying that they feel forced to hide their injury or suffer severe consequences. The idea is reinforced by Maurice Jones-Drew, NFL running back, when he stated, "The bottom line is: You have to be able to put food on the table. No one's going to sign or want a guy who can't stay healthy. I know there will be a day when I'm going to have trouble walking. I realize that." This attitude towards sport related injuries needs to be better understood or athlete health and longevity may continue to suffer.

### **Predictors of Injury Concealment**

While research has been done to understand the physical consequences of sports injuries and their long-term effects, much less has been done to understand the behavioral and social aspects that contribute to injury concealment. While the current literature is limited in this regard, some current literature reveals interesting ideas linking behavioral and social attitudes toward injury concealment. For example, Long et al. (2011) suggests links between

injury concealment and “losing performance roles, unfamiliarity and low trust with health care providers, ignorance about initially minor-looking injury, and higher pain tolerance thresholds” (p. 202). Other studies have suggested that masculinity is involved in athletic injury concealment by linking pain tolerance to the demonstration of (masculine) character (Nixon, 1992). Messner et al. (2013) supports these claims by stating that television sports intentionally train young boys to think that more masculine is superior and more effective in the sporting world. This ideology is built on by Mahalik et al. (2007) when they found that masculinity and the perceived normativeness of other men’s health behaviors significantly predicted the self-reported health behaviors of participants. In other words, men were more likely to follow the health behaviors of other men when they perceived those behaviors as normative.

While masculinity is believed to factor into the behaviors of athletes, other factors may also play a role. External influences from the team and coach is also something that may be contributing to these behaviors among athletes. This was observed by Aubrey et al. (2013) when they suggested that outside influences such as pressure put on a player from the team, or the coach to get an athlete back in the game, have a significant impact on the timetable of a return from an injury (p. 249). This could play in role in an athlete not properly recovering from their injury and is yet another way an athlete may be impacted later on in life after their playing days are complete.

Little work has been done to uncover the aspect of “fear of performance role loss” and vulnerability among athlete populations. Vulnerability was looked at by Kvist et al. (2005) when they researched the concern that many athletes have once initially injuring their anterior

cruciate ligament. Kvist et al. (2005) revealed that only about half of the athletes were able to ever return to their pre-injury activity level, which may hinder an athlete in accepting these injuries as truth. This statistic alone provides evidence for why an athlete may go into denial and avoid getting an injury looked at when it occurs. Being a part of a team may also be a viable reason for why athletes conceal injuries and this ideology has yet to be directly looked at when exploring injury concealing behaviors among young athletes. Research by Heere and James (2007) has shown the effects of team identity and group behaviors but relating this specifically to how this may influence an athlete to conceal a sports injury has yet to be determined and was a goal of this study.

## **Methodology**

### **Study Design**

A cross-sectional study design was employed in order to observe injury concealing behaviors among young male athletes. Participants were asked to complete an original survey assessing demographics, perceived appearance/masculinity, vulnerability, fear of losing a performance role, injury ramification awareness, factors regarding pressures from the team, and injury concealing behaviors. Questions and statements within the survey referred to behaviors that took place while participating in one's respective sport. In an attempt to reduce recall bias among the study population, younger athletes (ages 18-30) were preferred but a few older athletes were included in an effort to deal with outlier handling bias.

### **Ethical Considerations**

Participants completed the survey through Qualtrics Online Survey Software. When gathering data, any identifying information was kept strictly confidential. The survey included a consent form that listed an e-mail address and a phone number that a participant could have used to contact the study leader with any concerns. There were not any known issues in regards to this matter as of completion of the data collection.

### **Instrumentation**

The data was gathered using an original 35-question survey, which consisted of fixed, multiple selection questions as well as statement evaluation questions. The majority of the survey consisted of statement evaluations using an 11-point scale (0-10). Lower scores indicated that the individual disagreed with the statement (0= Strongly Disagree) whereas higher scores indicated agreement with the statement (10= Strongly Agree). Participants could have chosen a neutral option as well if they did not agree or disagree with a statement. This option was defined as a “5” ranking (5= Neutral).

The survey was broken down into seven sections. First, a demographic section was included in order to obtain an athlete’s age, sport played, level at which that sport was played, and injury history of that individual athlete. For the purpose of this study, a sports “injury” was defined as an ailment in which a medical procedure and/or rehabilitation was needed in order to return to normal functional ability. Any other type of bodily harm that may only require rest for healing was defined as being “hurt”. These stipulations were needed in order to compare athlete behaviors based on the type of bodily harm they encounter. Understanding these factors were important so that comparisons could be made between athletes who have previously been injured and those who have not. The remaining sections of the survey were divided into six distinct sections which included appearance/masculinity, fear of losing a performance role, vulnerability, injury ramification awareness, team mentality, and the intent to conceal an injury.

The first variable in the survey included five questions in regards to “appearance/masculinity” and this aimed to gain insight into how overall toughness and machismo (strong or aggressive masculine pride) affects injury reporting behaviors. Previous literature suggested that athletes may strive to look tough and ignore injuries in order to appear invincible in front of their teammates.

The next factor of “fear of losing a performance role” included four survey questions and specifically aimed to identify if athletes who conceal injuries are concerned about losing their spot on a team or suffer financial repercussions because of the injury. This variable was hypothesized by the researcher, and the panel of experts confirmed that this issue may indeed be present.

Following this section was a group of four questions that observed “vulnerability” among the young male athletes. This section of the survey explored the fact that injury concealment may be based on the fact that athletes feel less confident in their long term outlook (collegiate or professional) in their sport and in the state of their body’s ability to perform in the future after sustaining an injury. The panel of experts suggested “avoidance” as another title for this group of questions which also accurately represented the question types. Questions such as “If I am injured once I may never return to full strength”, are the types of statements that were included in this section.

The next part of the survey included six questions aimed to uncover an athlete’s “injury ramification awareness” because it is my belief that if an athlete is not educated on how to go about dealing with an injury or the long term ailments it may cause, it may in fact lead to injury

concealment. This portion of the survey was then followed up by a group of six questions which explored an athlete's sense of commitment to their teammates and how this may cause an athlete to want to remain in the game regardless of the state of injury.

Several questions on intent to conceal were asked in order to see how the previously answered questions may or may not lead to actual injury concealment if placed in that predicament. Statements in this section included questions such as, "If I have a minor injury and the pain is manageable, I will always conceal my injury and play on" and "If I am seriously hurt and cannot play to my full potential due to the pain, I will remain on the field until a coach or athletic trainer removes me." Assigning a high ranking to these questions indicated that an athlete is likely to engage in injury concealing behaviors. This group of questions concluded the survey and participants were then thanked for their time and participation.

### **Psychometric Analysis**

Due to the fact that this was an original survey, before data collection, a panel of experts who specialized in each of the composite variables and survey sections, helped build the survey in an attempt to make sure that the content of the survey was valid. The panel of experts consisted of an athletic trainer, a personal trainer, and a behavioral health scientist. The feedback given in regards to the composite variables and survey questions by those individuals were used to check the content validity of the survey tool. Modifications were made to the original survey based upon the feedback provided by the panel of experts. Also, following the completion of the data collection, post-metric analyses were conducted to once again ensure

that the data obtained from the survey tool was both reliable and valid. More specifically, Cronbach's Alpha was ran using SPSS to confirm reliability of the data obtained.

The reliability of each composite variable was obtained. The first portion of the survey which deals with "appearance/masculinity" received a Cronbach's Alpha value of .826, which shows that this portion of the survey was fairly reliable. The same was done for the remaining variables which included fear of losing a performance role, vulnerability, injury ramification awareness, and sense of commitment to the team and the Cronbach's Alpha score were, .697, .396, .338, and .619, respectively. The given Cronbach's Alpha values show the reliability of the survey tool. Analysis was focused on those portions of the survey with better reliability scores such as appearance/masculinity, fear of performance role loss, and team influence.

### **Sampling**

Participants were recruited via convenience sampling and consisted of students from local universities and colleges. Advertising for the study was completed by using flyers and through various social media outlets which included Facebook and Instagram. Flyers were placed at local colleges and community colleges in order to obtain participants from various locations and from different backgrounds. Advertisement on Facebook and Instagram was also used in order to access a wide variety of athletes at a single point in time. Messages on social media read as follows:

*Attention All Male Athletes: I am conducting a research study on injury concealment among young males and participants above the age of 18 are needed. An online survey which*

*should take no more than 10 minutes to complete is your only obligation for participating. Any help would be greatly appreciated. If you wish to participate, please contact me via private message.*

At the time of recruitment, participants were also informed that they would not receive any compensation for their involvement in the study and could withdraw from the study at any point.

### **Inclusionary/Exclusionary Criteria**

In order to be eligible for participation in this study, participants must have been a current college athlete or have played a varsity level sport in high school. The inclusion criteria of earning a varsity letter was put into place in order to make sure that only those athletes who have a solid foundation of athletic competition would take part. In addition to the inclusion criteria of earning at least a high school varsity letter, participants must have been over the age of 18. The questions within the survey focused on an athlete's younger (high school and college) playing days. The inclusion and exclusion criteria were defined and put in place in order to make sure the sample size targeted the correct populations with the hope of obtaining more accurate data. Several participants began the survey but skipped random questions for reasons unknown to the researcher and because of this missing data, their results were not included in the final data set. After cleaning the data and eliminating participants who did not meet the inclusion criteria or complete the entire survey, the sample consisted of 96 male athletes (n=96).

## Results

### Demographics & Descriptives

A total 96 adult men met the criteria to take part in the study. The distribution of the age of participants, as seen in Figure 1, shows a positive skew with a mean age of 24.6 and a standard deviation of 7.2. Due to the fact that the sampling methods targeted college athletes, the shape of the distribution was expected.

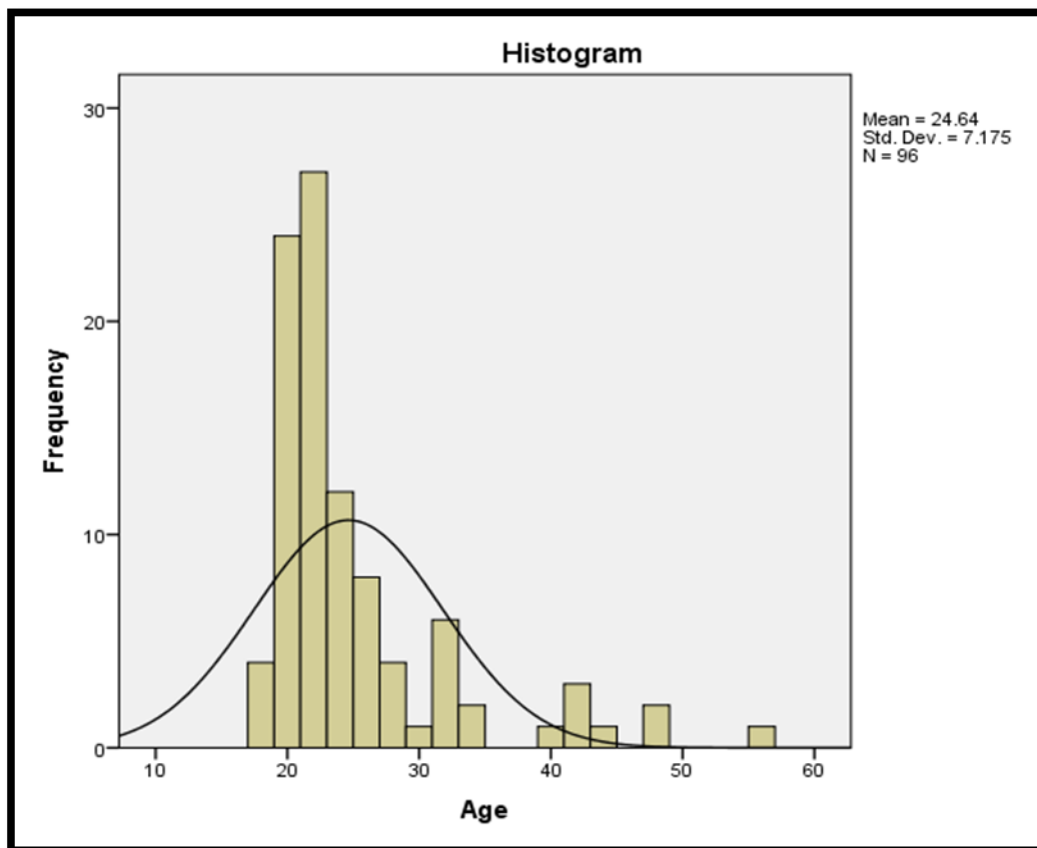


Figure 1

A frequency table of the type of sport that participants took part in was produced and yielded the following results. Approximately 28% of athletes indicated that they participated in a non-team sport while 72% of participants indicated that they participated in a team sport, which can be seen in Figure 2.

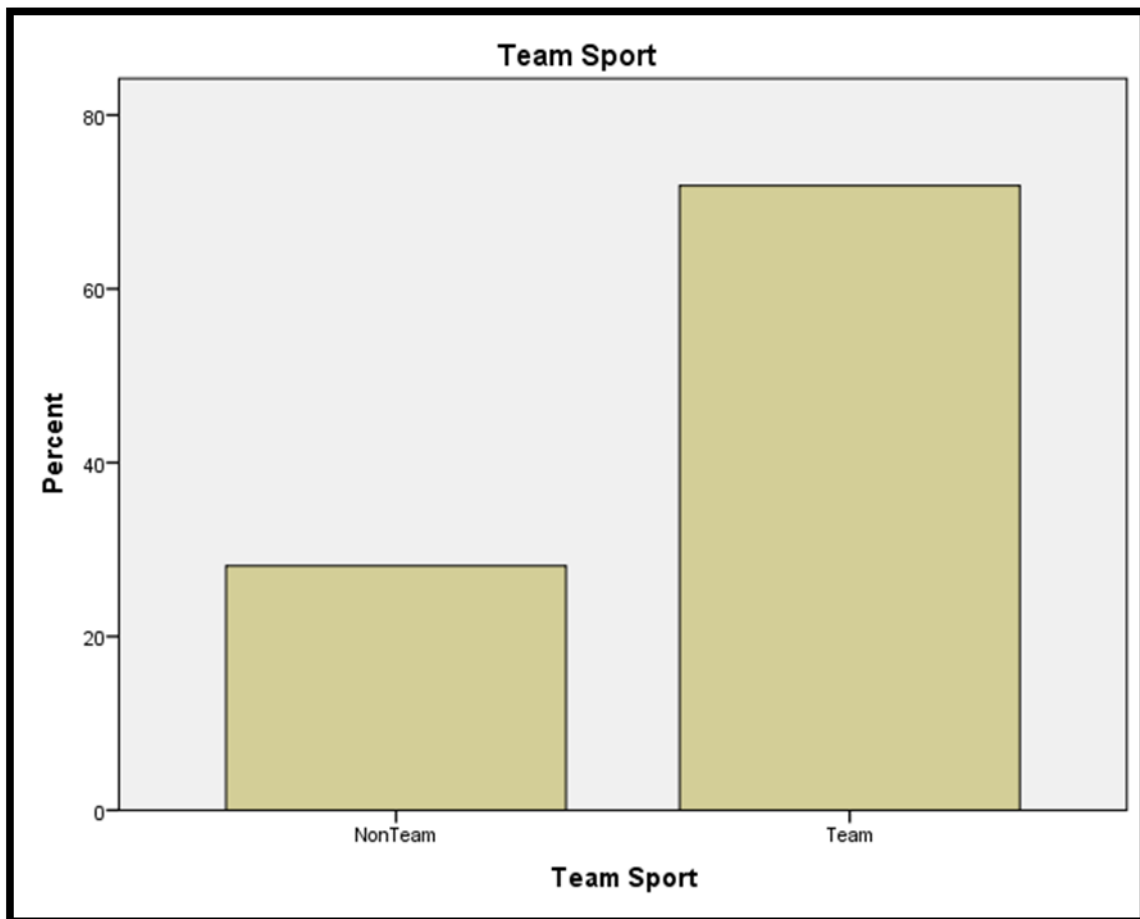


Figure 2

In addition to obtaining data about the sport that the participant played, the previous injury history of each athlete was also obtained. The groupings were made based on the responses made to two survey questions in regards to previously being injured. Results showed

that about 62% of participants had been seriously injured, which was defined as an injury needing treatment and/or rehabilitation. Results can be seen in Figure 3.

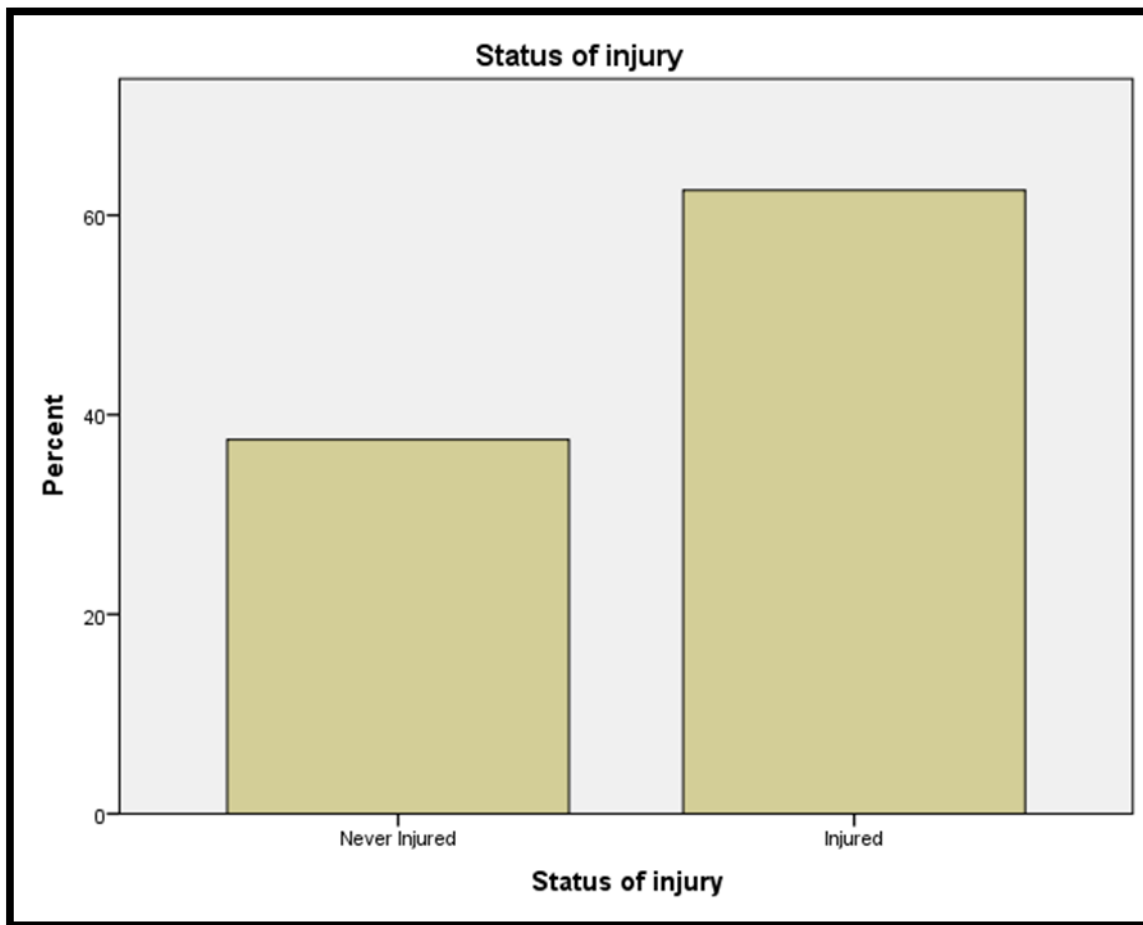


Figure 3

Means were also calculated for the Concealment variable and low, medium, and high groups were formed from the given data. Groups were broken into equal sizes with the low concealment group having an average score ranging from 1.00 – 6.33, a medium concealment

group with an average score ranging from 6.33 – 8.00, and a high concealment group with an average score ranging from 8.00 – 11.00. A frequency table of results are seen in Table 1.

**Table 1.**

Concealment Score					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.33	1	1.0	1.0	1.0
	2.67	2	2.1	2.1	3.1
	3.00	1	1.0	1.0	4.2
	3.67	1	1.0	1.0	5.2
	4.00	1	1.0	1.0	6.3
	4.33	5	5.2	5.2	11.5
	5.00	3	3.1	3.1	14.6
	5.33	5	5.2	5.2	19.8
	5.67	1	1.0	1.0	20.8
	6.00	7	7.3	7.3	28.1
	6.33	6	6.3	6.3	34.4
	6.67	3	3.1	3.1	37.5
	7.00	8	8.3	8.3	45.8
	7.33	4	4.2	4.2	50.0
	7.67	7	7.3	7.3	57.3
	8.00	11	11.5	11.5	68.8
	8.33	4	4.2	4.2	72.9
	8.67	8	8.3	8.3	81.3
	9.00	3	3.1	3.1	84.4
	9.33	2	2.1	2.1	86.5
	9.67	2	2.1	2.1	88.5
	10.00	3	3.1	3.1	91.7
	10.33	1	1.0	1.0	92.7
	11.00	7	7.3	7.3	100.0
Total		96	100.0	100.0	

### Bivariate/Multivariate Analysis

The main composite variables in which high reliability scores were obtained were Appearance/Masculinity and Fear of losing a performance role. The means and range were calculated for these two variables and groups of low, medium, and high were formed in order to perform additional analysis (Table 2).

**Table 2.**

Calculated Means by Grouping									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Appearance	Low	33	5.4121	2.35475	.40991	4.5772	6.2471	1.00	11.00
	Medium	33	7.0364	1.81415	.31580	6.3931	7.6796	2.80	10.40
	High	30	8.6800	1.73770	.31726	8.0311	9.3289	4.60	11.00
	Total	96	6.9917	2.38026	.24293	6.5094	7.4740	1.00	11.00
Fear	Low	33	6.2424	2.50038	.43526	5.3558	7.1290	1.33	10.67
	Medium	33	8.4444	1.84403	.32101	7.7906	9.0983	4.33	11.00
	High	29	8.7471	1.81190	.33646	8.0579	9.4363	4.67	11.00
	Total	95	7.7719	2.35314	.24143	7.2926	8.2513	1.33	11.00

Homogeneity of variance was also tested using a Levene test (Table 3). The performed Levene test showed no significance for the variables at hand. Appearance/Masculinity showed a significance value of .367 while “fear of losing a performance role” showed a significance value of .065 which are both not significant and thus showed equal variance of the variables.

**Table 3.**

<b>Test of Homogeneity of Variances</b>				
	Levene Statistic	df1	df2	Sig.
Appearance	1.014	2	93	.367
Fear	2.810	2	92	.065

An ANOVA test (Table 4) was also conducted for the Appearance/Masculinity and Fear of losing a performance role variables and both of the variables indicated significance in regards to their relation to injury concealment with values of .000 being calculated for both. Those athletes with higher Appearance/Masculinity scores and those athletes with higher Fear of losing a performance role scores were more likely to conceal injuries than the athletes with lower scores in these groups.

**Table 4.**

<b>ANOVA</b>						
		Sum of Squares	df	Mean Square	F	Sig.
Appearance	Between Groups	167.914	2	83.957	21.084	.000
	Within Groups	370.320	93	3.982		
	Total	538.233	95			
Fear	Between Groups	119.704	2	59.852	13.739	.000
	Within Groups	400.799	92	4.357		
	Total	520.503	94			

In order to compare the Appearance/Masculinity and Fear of losing a performance role variables to the Concealment groups, a Tukey Post-Hoc test was then performed (Table 5). Significance was found among all groups except between medium and high concealment groups when being compared to the Fear of losing a performance role variable. A p-value of .837 was reported for this group and was the only non-significant finding among the post-hoc analysis. This provided evidence that more masculine athletes are more likely to conceal injuries. This also showed that athletes who are fearful of losing a performance role are more likely to conceal injuries than those who are not.

**Table 5.**

Tukey Post-Hoc							
Tukey HSD							
Dependent Variable (I) Concealment (J) Concealment			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Appearance	Low	Medium	-1.62424*	.49125	.004	-2.7943	-.4542
		High	-3.26788*	.50338	.000	-4.4668	-2.0689
	Medium	Low	1.62424*	.49125	.004	.4542	2.7943
		High	-1.64364*	.50338	.004	-2.8426	-.4447
	High	Low	3.26788*	.50338	.000	2.0689	4.4668
		Medium	1.64364*	.50338	.004	.4447	2.8426
Fear	Low	Medium	-2.20202*	.51384	.000	-3.4261	-.9779
		High	-2.50470*	.53126	.000	-3.7703	-1.2391
	Medium	Low	2.20202*	.51384	.000	.9779	3.4261
		High	-.30268	.53126	.837	-1.5683	.9629
	High	Low	2.50470*	.53126	.000	1.2391	3.7703
		Medium	.30268	.53126	.837	-.9629	1.5683
*. The mean difference is significant at the 0.05 level.							

Additional analysis was conducted in order to see if a relationship was present between concealment groups and team sports. A Cross Tabulation (Table 6) and Chi Square analysis (Table 7) was performed which showed significance among concealment groupings and whether an athlete plays a team or non-team sport. In the low injury concealment category, 54% of participants participated in a non-team sport where as in the high concealment category, only 10% of participants participated in a non-team sport.

**Table 6.**

Concealment * Team Sport Cross Tabulation					
			Team Sport		Total
			Non-Team	Team	
Concealment	Low	Count	18	15	33
		% within Concealment	54.5%	45.5%	100.0%
		% within Team Sport	66.7%	21.7%	34.4%
		% of Total	18.8%	15.6%	34.4%
	Medium	Count	6	27	33
		% within Concealment	18.2%	81.8%	100.0%
		% within Team Sport	22.2%	39.1%	34.4%
		% of Total	6.3%	28.1%	34.4%
	High	Count	3	27	30
		% within Concealment	10.0%	90.0%	100.0%
		% within Team Sport	11.1%	39.1%	31.3%
		% of Total	3.1%	28.1%	31.3%
Total	Count	27	69	96	
	% within Concealment	28.1%	71.9%	100.0%	
	% within Team Sport	100.0%	100.0%	100.0%	
	% of Total	28.1%	71.9%	100.0%	

**Table 7.**

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.885 <sup>a</sup>	2	.000
Likelihood Ratio	17.800	2	.000
Linear-by-Linear Association	15.595	1	.000
N of Valid Cases	96		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.44.			

Analysis was also conducted to uncover if a relationship was present between injury concealment and previous injury history. A Cross Tabulation (Table 8) and Chi Squared analysis (Table 9) was performed but the results provided no significant findings.

Table 8.

Concealment * Injury Status Cross Tabulation						
			Injury Status			Total
			Neither	Only Hurt	Injured	
Concealment	Low	Count	4	8	21	33
		% within Concealment	12.1%	24.2%	63.6%	100.0%
		% within Injury Status	57.1%	28.6%	34.4%	34.4%
		% of Total	4.2%	8.3%	21.9%	34.4%
	Medium	Count	3	8	22	33
		% within Concealment	9.1%	24.2%	66.7%	100.0%
		% within Injury Status	42.9%	28.6%	36.1%	34.4%
		% of Total	3.1%	8.3%	22.9%	34.4%
	High	Count	0	12	18	30
		% within Concealment	0.0%	40.0%	60.0%	100.0%
		% within Injury Status	0.0%	42.9%	29.5%	31.3%
		% of Total	0.0%	12.5%	18.8%	31.3%
Total	Count	7	28	61	96	
	% within Concealment	7.3%	29.2%	63.5%	100.0%	
	% within Injury Status	100.0%	100.0%	100.0%	100.0%	
	% of Total	7.3%	29.2%	63.5%	100.0%	

Table 9.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.255 <sup>a</sup>	4	.262
Likelihood Ratio	7.162	4	.128
Linear-by-Linear Association	.290	1	.590
N of Valid Cases	96		
a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is 2.19.			

## **Discussion**

### **Study Overview**

This primary purpose of this study was to uncover the specific reasons why young male athletes may conceal injuries that are encountered while participating in their sport. Previous evidence suggests that athletes may conceal injuries due to a variety of reasons including masculinity, team commitment, and fear of losing a performance role. This study aimed to uncover why this trend is taking place by observing several independent variables such as appearance, vulnerability, fear of losing a position, team influence, and injury ramification awareness.

### **Primary Findings**

The intent of this study was to understand why young male athletes may conceal their sports injuries. A sample of ninety-six male athletes completed the primary survey. Younger athletes were of interest due to the fact that they may have certain pressures and influences that other athletes may not have which include playing for a school scholarship or even playing in hope of a future career.

#### *Team Sport versus Individualized Sports*

Significant differences were found when observing the differences between those participants who primarily played a team sport versus those who primarily played an individual

sport. The data suggests that participants with high concealing intentions were 9x more likely to conceal their injuries if they played a team sport compared to those who played a non-team sport (Figure 9). The previous findings were further confirmed when looking at the low concealment group, as it showed about an even split of athletes who played a team versus non-team sport ( $p=.000$ ). The results indicate some connection between participating in a team oriented sport and concealing an injury which supports claims made by Aubrey et al. (2013). The overall “team mentality” and feeling a sense of commitment to ones teammates may play a role. Also, the possibility of losing a spot or position on the team to one of the other players may play a factor in the concealing behaviors of these athletes.

#### *Fear of Performance Role Loss*

The data suggests that athletes who were more fearful of losing their spot or position on the team were more likely to conceal their injuries than those athletes who were not fearful of the said issues (Tables 4 & 5). A loss of performance roles was suggested in previous literature by Long et al. (2013) and was supported by these findings. Several factors such as losing practice time, losing a spot on the team, or even fear of suffering a financial loss because of an injury were all questions asked and are thus possible reasons why the results showed this trend.

### *Appearance/Masculinity*

The Appearance/Masculinity of an athlete in relation to their intent to conceal an injury was also tested. The goal of this variable was to gauge the level of masculinity and toughness of these athletes and to observe the importance of their appearance to the athlete himself. Significant differences were present between all groups showing more masculine athletes were concealing injuries at a higher level than those athletes who cared less about their appearance. Wanting to look tough and invincible are ideas that have been discussed in past literature as qualities that many athletes have and this may lead to them concealing injuries at the rates they do. Diagnosing these athletes may be especially difficult as young athletes may even wish to appear tough in front of medical personnel and not just the team itself. The need to understand these highly masculine athletes is very important and should be researched further in the coming years.

### *Injury History*

Data analysis was also performed on the relationship between an athlete's injury history and their likeliness to conceal an injury in the future. No significant relationship was found but with a more proper sample size, a significant difference may be present as an increase in means did occur.

## **Hypothesis Outcomes**

### **Hypothesis 1: Impact of Appearance and Masculinity**

The first hypothesis was supported by the data with statistically significant differences between all concealment groups (Tables 4 & 5). Athletes who care more about appearing masculine are more likely to conceal their injuries than those who do not. The overall need to appear tough and invincible has been suggested in past literature by Nixon (1992) and most likely remains a driving factor for why athletes behave the way they do in regards to injury concealment. The ideas suggested by Messner et al. (2013) which stated that television leads young men to believing that more masculine character is superior, may also be a driving factor for the reasons that young men are concealing injuries.

### **Hypothesis 2: Impact of Team Influences**

Hypothesis 2 was also supported by the data obtained. The results showed significant differences in injury concealing tendencies between those athletes who participated in a team sport compared to those who played an individual sport (Table 6 & 7). There were nine times more athletes who fell in the high concealment category that played a team sport than that played an individual sport which supports the hypothesis in itself. This supports the claims made by Aubrey et al. (2013) with regard to pressures from the team to remain in the game regardless of the injury obtained. The hypothesis itself stated that this increased likelihood to conceal injuries was due to an athlete not wanting to let their teammates down. This specific idea was unable to be confirmed with the data collected, although this may be the case.

### Hypothesis 3: Impact of Fear

The third hypothesis was also supported by the data. Significant differences were found among athletes with high “fear of losing a performance role” scores and athletes with lower “fear of losing a performance role” scores in regards to their injury concealing tendencies. Losing time on the field and having another player gain an advantage while an athlete is recovering from an injury may be a reason why young athletes mask injuries. This supports previous claims made by Long et al. (2013) in regards to an injury causing athletes to possibly lose performance roles.

### Hypothesis 4: Impact of Injury Ramification Awareness

While hypothesis 4 was tested, post-study reliability scores were too low to make a claim in regards to an athlete’s level of injury ramification awareness and their likelihood to conceal.

### **Limitations**

The use of an original survey tool presents limitations when it comes to reliability and validity. While the tool was validated (content validity) a priori by a panel of experts, the reliability was not tested prior to the data collection and could possibly be a source of error. Parts of the survey yielded high reliability scores while others did not and these sections should be reevaluated for future research.

The sampling methodology may also introduce bias as only athletes that attended universities were recruited. The convenience sampling of these athletes may lead to more educated athletes being in the study and thus having more knowledge of possible long-term health consequences that injury concealment may cause. This may lead to a compromise of the generalizability as all athletes do not have the same level of education and many even play professionally without any college education at all.

Misclassification bias may have been an issue when asking athletes to determine whether or not they had been hurt or injured in the past. While descriptions of each were given in the survey, terms such as rehabilitation may have been interpreted differently by different athletes and thus may lead to improper comparisons being made.

Recall bias may also be an issue as many of the athletes who took part in the study were not currently playing a sport at the time of the study. Many athletes only participated in high school sports as well and were asked to answer questions about their behaviors and feelings from a few years prior. While most questions did not involve specific instances from their playing days, their feelings might have changed years after the time in which they may have concealed an injury.

Participants may have also felt a pressure to answer in a certain way in fear that a coach or team medical advisor may find out about their current or previous injury. Attempts to limit these feelings were made by informing the participants that their results would be kept completely anonymous but there was at least one participant who asked about this issue during the survey.

### **Recommendations for Future Research**

More research is needed on the specific reasons why young athletes are concealing injuries and ignoring the possible long-term consequences that may occur as a result of this. While research on the fact that concealment is taking place is present, the specific reasons why are very limited. The findings of this study suggest that a more masculine appearance, being part of a team, and being fearful of losing a performance role are all factors leading to injury concealment among young athletes. These ideas should be confirmed, and other variables such as injury ramification knowledge is in need of reliable data. Also, the influence of coaches and more authoritative athletic personnel on injured athletes should be looked at in order to comprehend if this is affecting their injury concealing behaviors.

Future research should also look at concussions specifically as they have become a major issue in the sports world. Research should strive to uncover the reasons why concussions are so often concealed and if this brain injury itself is playing a role in the mental process at the time of injury. By understanding the reasons why young athletes are concealing injuries, medical professionals will be better able to treat these athletes and thus improve athlete health and longevity in the years to come.

## **Appendix A: IRB Approval**

## **Appendix A: IRB Approval**

Approval of Exempt Human Research

From: UCF Institutional Review Board #1 FWA00000351, IRB00001138  
To: Michael J. Rovito  
Date: December 11, 2014

Dear Researcher:

On 12/11/2014, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination Modification Type: The age criteria has changed from 18-30 years of age to 18 years or older. A revised protocol has been uploaded in iRIS. Project Title: Psychosocial Indicators of Injury Concealment Among Young Male Athletes Investigator: Michael J. Rovito IRB Number: SBE-13-09561 Funding Agency: Grant Title: Research ID: n/a

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

IRB Coordinator

## **Appendix B: Consent Form**

## Appendix B: Consent Form

### EXPLANATION OF RESEARCH

Title of Project: **Psychosocial Indicators of Injury Concealment among Young Male Athletes**

You are being invited to take part in a research study. Whether you take part is up to you.

- The primary purpose of this study is to gain insight into some of the behavioral factors that may influence injury-reporting behaviors in young male athletes.
- If you choose to participate in this study, you will be asked to complete an online survey at the location of your choice. The survey should take no more than 20 minutes of your time. The researchers do not expect any significant risks associated with the survey, but you may come across a question that makes you feel uncomfortable.
- Your survey responses will remain completely anonymous and will never be linked to your name. Your participation is voluntary and you may withdraw from the study at any time without penalty.

You must be 18 years of age or older to take part in this research study.

**Study contact for questions about the study or to report a problem:** If you have questions, concerns, or complaints, contact: Dr. Michael J. Rovito, Faculty Supervisor, Department of Health Professions, by email at [michael.rovito@ucf.edu](mailto:michael.rovito@ucf.edu). Should you need assistance from UCF's Counseling and Psychological Services, please contact them at by telephone at (407) 823-2811 or by email at [councntr@ucf.edu](mailto:councntr@ucf.edu).

**IRB contact about your rights in the study or to report a complaint:** Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

Thank you for your consideration to participate in this research study. Your information is essential to help further knowledge in regards to injury-reporting behaviors among young male athletes

Sincerely,

Michael J Rovito, Ph.D.

Instructor

Department of Health Professions, Health Sciences Pre-Clinical Program

(407) 823-3888

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## **Appendix C: Survey**

## Appendix C: Survey Tool

MHI SURVEY QUESTIONS: Rate 0-10 scale

### Demographics

Age:

Sport Played:

At what level was this sport played? High school or College

Number of years involved:

Have you ever seriously injured (requiring medical/professional treatment) while playing a sport? Y/N

Have you ever been hurt (only rest is required for healing) while playing a sport? Y/N

Rate the following statements from 0-10 Scale.

0= Strongly Disagree

5=Neutral

10=Strongly Agree

Appearance/Masculinity:

1. Missing a game will make me look weak.
2. It is important to appear invincible in front of any teammates
3. The best players appear to play more physical than others
4. Showing pain is a sign of weakness

5. I will not feel pride in myself if I miss a game due to injury

Fear:

1. Missing games or practices due to injuries may cause me to lose my spot on the team
2. An injury could end my athletic career
3. I am comfortable discussing my state of health with an athletic trainer or physician
4. Sitting out/missing games may cause me scholarship/financial loss in my future

Vulnerability:

1. After being injured once, I may not ever return to full strength
2. Other teammates get better than me when I sit out for a period of time
3. If I take a break from playing, my fitness will not recover to its original point
4. I ignore pain hoping that it will eventually go away

Knowledge:

1. I was taught about the ramifications of playing through an injury
2. I am aware of the benefits/risks that come along with playing sports
3. My health is important to me
4. A minor ache could become a serious problem
5. If I can play through pain, it is not a serious injury
6. I will ignore an athletic trainer or physician if I feel I can play through the pain

Team Mentality:

1. I feel a sense of commitment to my teammates
2. It is important to be respected by my teammates

3. I feel pressured by my coach to act in a certain way
4. My parents will view me as a quitter if I don't play in a game
5. If the team loses a game that I sit out, I will view it as my fault
6. If my teammates aren't happy with me, I will feel isolated

Concealment Questions:

1. If I have a minor injury and the pain is manageable, I will always conceal my injury and play on
2. If I am seriously hurt and cannot play to my full potential due to the pain, I will remain on the field until a coach or athletic trainer removes me
3. If there is ever ANY pain in my body, I will sit out until I am fully healed

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