

## Student Athletes' Perceptions of Concussions through Media Consumption

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### Abstract

Recently, concussions have become a popular topic among media outlets. Because of the long-term health effects associated with traumatic brain injuries as studied in football players such as Alzheimer's and Amyotrophic Lateral Sclerosis (ALS), also known as Lou Gehrig's disease, this health crisis coverage is on the rise. On August 31, 2012, the National Football League (NFL) and the United States Army announced a partnership to raise awareness of traumatic brain injuries, specifically concussions in athletes and those serving in the armed forces. This partnership between the NFL and the Army received enormous media attention and was profiled on most major media outlets.

Information concerning concussions is readily available to the public through various media outlets and the Center for Disease Control and Prevention's (CDC) "Heads Up" campaign. Based on this readily available data, do college athletes actively engage and utilize information to become more knowledgeable about concussions and the impact upon their future health? To determine an answer, a 10-question, IRB-approved survey was sent via email to athletes who played football, lacrosse, soccer, basketball, and field hockey at three National Collegiate Athletic Association (NCAA) Division III Middle Atlantic Conference (MAC) colleges and universities. Female athletes completed the survey at 52.6% while males completed the survey at 47.4%. The age range of survey respondents was 18 to 22 and the data they provided were descriptively and inferentially analyzed.

This study determined there is a relationship between college athletes sustaining concussions and their concussion management though the consumption of the media portrayals of these traumatic brain injuries. In addition, respondents used new media vehicles 69% as compared to traditional media vehicles at 31% to investigate the long term health effects of concussions.

**Keywords:** Concussion; Traditional media vehicles; New media vehicles; Alzheimer's disease; ALS; NFL; Media

### Introduction

Every year, thousands of people participate in sporting activities from kayaking to cheerleading to football and soccer [1-3]. The benefits of engaging in these types of activities are great, but there are also risks. According to the Department of Neurosurgery at the University of Pittsburgh (2013), those participating in contact sports have a 19% or higher chance to sustain a concussion. A hit, blow, or knock to the head that results in a disturbance to the normal functioning of the brain is known as a concussion [4]. It is estimated that the number of diagnosed sports-related concussions averages 300,000 per year [5].

To educate the public about the long-term effects of concussions, the government, media, and particularly the Nation Football League (NFL) have created media campaigns to disseminate the information. A study conducted by Scott, Lionbarger, Zambon, Eckstein, and Ibacache [6] revealed the number of traumatic brain injury articles in United States newspapers associated with sports had increased from their previous study. Recently, Junior Seau's suicide has been linked to severe brain trauma after a thorough examination of his brain was completed [7]. During the of summer 2012, Brandon McCarthy, pitcher for the Oakland Athletics, sustained numerous head injuries

after being hit with a line drive baseball [8]. The graphic video of McCarthy being hit in the head with the baseball has been viewed hundreds of thousands of time on YouTube as determined by simply searching the name Brandon McCarthy. Williams, Sullivan, Schneiders, Ahmed, Lee, Balasundaram, and McCrory [9] found that news outlets were responsible for uploading the majority of concussion videos to YouTube. If the number of stories written and views on YouTube about Junior Seau and Brendan McCarthy are indicators that the public has a great interest in traumatic brain injuries, then why do athletes still participate in contact sports in which concussions are more likely to occur?

The purpose of this study was to determine if a relationship exists between college athletes sustaining concussions and the consumption of the media portrayals of these traumatic brain injuries for concussion management. The study also sought to determine if new media vehicles are used more than traditional media vehicles by college athletes to research concussions. Therefore, the hypotheses guiding this research are:

**H1:** There is a relationship between college athletes sustaining concussions and the consumption of the media portrayals of these traumatic brain injuries for concussion management.

**H2:** New media vehicles will be used more than traditional media vehicles by college athletes to research the long-term health of these brain injuries in terms of concussion management.

## Concussion and Media Research: Theory, Studies, and Relevant Literature

Keating [10] noted that concussions frequently make headlines in sports reporting. Thousands of professional, amateur and youth football players seek ways to minimize the risk of concussions. According to Moehringer [11], "Ominous headlines, frowning scientists, addled Hall of Famers, the whole slowly unfolding buzz kill can't help but have a suppressive effect on parents". A 2012 ESPN Research and the Global Strategy Group surveyed more than 1,000 people and found that approximately 57% of parents in the pool of respondents were less likely to allow their children to play youth football, with about two thirds noting concussions were a serious issue in the sport. However, the 2012-13 High School Athletics Participation Survey found that football ranked number five in the "ten most popular boys programs" according to National Federation of State High School Associations [12]. The ESPN survey also found that 18% of NFL fans are so concerned with the debate regarding concussions (changing the game to minimize hard hits to reduce injuries versus keeping hard hits and maintaining the popularity of the game) that they are less likely to watch football on television [13]. The 2013 Nielsen data counter this argument as Taube [14] states, "Our national pigskin obsession is so great that live NFL football accounted for a staggering nine of the 10 most-watched telecasts of 2013". Angel [15] indicated that the NFL works to raise concussion awareness, but its players do not. Some may dispute this statement given the recent \$765 million concussion settlement between the NFL and former players [16].

As such, NFL players are no longer perceived as "men of steel"; however, players continue to believe they are when they return to play after receiving a concussion on the same day. Dean Crowell stated, "I personally have seen an athlete knocked unconscious and return in the same quarter in recent years" [17]. The suicide death of Junior Seau, a 12-time Pro Bowl linebacker in the NFL who played for 20 years, has placed an emphasis on brain injuries in professional football players [18]. Hockey players, along with many others who play contact sports, have the same fear as football players. A Canadian concussion study led by Dr. Paul Echlin concluded:

Despite several years of intensive research, coverage and discussion about the dangers of concussions, the idea of playing through head injuries is so deeply rooted in hockey culture that two university teams kept concussed players on the ice even though they were taking part in a major concussion study.

The National Federation of State High School Associations (NFHS) [19] noted that parents and coaches who observe signs, symptoms and behaviors associated with a concussion must immediately remove the athlete from the activity for professional diagnosis. According to an ESPN. The Magazine survey, "One of every three players said he had lied about having a concussion" [20]. In addition, the survey found that "53.6 percent [of high school seniors] said they would risk brain damage for a shot at the pros (up from about half of the players in a 2010 survey)" [21]. In doing so, players risk long-term brain damage [22] and a very uncertain future. Players are now looked at as individuals who one day may suffer from a brain disease due to concussions sustained while playing a high-risk, contact sport [23].

Some NFL players such as Aaron Rodgers, who took himself out of a game after hitting his head [24] and collegiate football players are becoming more concerned about their long-term health due to injuries sustained while playing the game. A class action lawsuit by collegiate

athletes was recently filed against the NCAA. "Emails filed in federal court question the efforts of the National Collegiate Athletic Association and many colleges to protect players who have suffered concussions" [17]. Those current and former players filing suit allege that although their injuries have healed enough to play, the long-term injuries sustained could be with them for the rest of their lives and without medical care to properly treat the medical condition [20].

In a study conducted by Covassin, Elbin, and Sarniento [25], the researchers sought to determine the effectiveness of using the Center for Disease Control [26] and Prevention's (CDC's) "Head's Up: Concussion in Youth Sports" to deal with concussions and concussion related issues. Covassin, Elbin, and Sarniento [25] found that by educating coaches with relevant information pertaining to concussions that "youth sport coaches were able to appropriately, prevent, recognize, and respond to sports-related concussions". If these materials were used to better educate coaches on issues related to concussions, and thus college athletes received more information about the long-term effects of concussions prior to collegiate play, would players become better informed about the long-term health effects due to concussions?

## Theoretical Framework

Media engagement is a person's collection of experiences with a media brand [27]. In their research, Mersey et al. [27] demonstrated that individuals' experiences with the media vary and can be utilitarian or providing information, hedonic or escapism, and social-psychological. Framing theory and the Two-Step Flow theory provide a conceptual background for concussion management through the media portrayals of concussions and how the public engages with relevant information. Framing theory posits that news and events are often framed by the media through "production, content, and media use perspectives" [28]. Therefore, the media creates frames or stories and then utilizes their outlets to disseminate the frames to the public. These processes are known as frame-building and frame-setting [29]. In addition, the persistence of frames created by the media when researching the public understanding of politics persisted across points in time has been studied by Lecheler and Vreese [30]. Stories focusing on the long-term health effects of concussions or videos depicting an individual sustaining a concussion provide examples of framing theory in practice. It can also be used to study the media used by college athletes when researching the health effects of concussions and their use of these "frames" to become better informed about these issues.

According to Baran and Davis [31], two-step flow theory suggests that information from the media is shared by opinion leaders. Opinion leaders consume information from the media and then provide information to followers. Followers are influenced by these opinion leaders, and most of this influence occurs at the same level in society, or horizontal flow. Opinion leaders, who are found at all levels of a community, are more likely to consume information from the media than followers. In addition, opinion leaders are more likely to have more social contacts than followers. In a study conducted by McClellan and McKinlay [32], the researchers found that in televised rugby games the viewing audience saw players suffer concussions and return to play in the same game, sometimes within minutes. By applying two-step flow theory to this research, the audience is shown through the media or opinion leaders that it is acceptable to suffer a concussion and return to play. This is in direct contrast to advice given by medical professionals who are experts in concussion management.

As noted, the purpose of this study was to determine if a relationship exists between college athletes sustaining concussions and concussion management through the consumption of the media portrayals of these traumatic brain injuries to investigate their effects.

## Methods

### Sample

College athletes were defined in this research as athletes who play football, lacrosse, soccer, basketball, and field hockey at three National Collegiate Athletic Association (NCAA) Division III Middle Atlantic Conference (MAC) colleges and universities, which are King's College, Wilkes-Barre, Pennsylvania; Wilkes University, Wilkes-Barre, Pennsylvania; and Misericordia University, Dallas, Pennsylvania. Participants played football, lacrosse, soccer, basketball, and field hockey during the fall 2012 or winter 2012-2013. Athletic directors at each institution were informed of the study and emails were sent to each athlete on the poster listed on the college website. While the sports chosen are among those with the most common occurrence of concussions (CDC, n.d), the sample was chosen since there was a gap in the literature concerning college athletes and concussion management through consumption of media portrayals of concussions.

The study utilized a quantitative approach with two variables. The independent variable was an athlete sustaining a concussion within the most current season of play. The dependent variable "consumption of media portrayals of concussions" for concussion management was defined as taking in media content by an individual or group, including news, print media, and broadcast [33].

In this study, concussion management through the consumption of media was defined as college athletes who receive information about concussions via television, radio, newspapers, magazines, and the Internet, which includes social media, email, the World Wide Web, and blogs. According to TheFreeDictionary.com [34], portrayal is "a representation or description". In this study, portrayal was defined as the communication of information about concussions to college athletes. The researchers defined traditional media as radio, television, newspapers, and magazines and defined new media as Internet, social media, blogs, and web video. Respondents could also add another form of media not listed as a choice in a field noted as "other."

### Instrument

Prior to administering the study, the researchers obtained approval from the Institutional Review Board at King's College. In addition, athletic directors at each of the participating institutions agreed to support the project. Utilizing "Survey Monkey" as the distribution vehicle, a 10-question survey was sent electronically to college athletes (respondent emails were posted on each institution's web site and were gathered by the researchers). The survey was adapted from Miyashita's [35] dissertation, "The impact of an educational intervention on college athletes' knowledge of sports related concussions". Data was collected during April 2013 from 57 college athletes or 10% of the sample, and to obtain the highest possible response rate, the survey was distributed to the college athletes on three occasions. The survey included nine closed questions and one closed-ended question. For purposes of this paper, only the open-ended questions were used. Respondents quantified their media consumption by identifying which

forms of media they used for concussion management to investigate the long-term health effects of concussions.

### Statistical analysis

Descriptive and inferential statistics were utilized. A chi square test of independence was used to determine statistical significance for hypothesis 1. The chi square test was used as both the independent and dependent variables were nominal in nature [36]. Descriptive statistics such as percentages and frequency counts were used for hypothesis 2.

### Delimitations

This study was confined to student athletes at three colleges and universities in Luzerne County, Pennsylvania, and the results are not generalized beyond these colleges and universities. The researchers assumed that the respondents to the survey were truthful in their reporting. It was also assumed that the participants understood the questions as they responded.

Sampling bias was present in the study as athletic teams that were convenient to the researchers were utilized at all three colleges and universities used in the study. Misclassification bias and stochastic error may also be present in the results of the survey.

### Analysis

The findings for this study were based on information received from 57 survey participants. There were 30 females or 52.6% as compared to 27 males or 47.4% who completed the survey. All survey respondents were between the ages of 18 and 22 and the age breakdown can be found in Table 1.

Age	Total	Percentage
18	19	17.55%
19	20	35.10%
20	13	22.80%
21	10	17.55%
22	4	7%

Table 1: Survey respondents age.

Sport	Total	Percentage
Basketball	2	3.50%
Field Hockey	13	22.80%
Football	11	19.30%
Soccer	31	54.40%

Table 2: Survey respondents sport participation.

This research was specifically focused on sports that traditionally incurred high numbers of concussions and the breakdown of sports by survey respondents is listed in Table 2. Those who played soccer responded to the survey at the highest rate of 54.4%, followed by field hockey at 22.8%, football at 19.3%, and basketball at 3.5%. Table 3 lists

the breakdown for those survey respondents who sustained a concussion at 12 or 21% and those who had not sustained a concussion at 45 or 79% [37].

Concussion	Total	Percentage
Did sustain a concussion	12	21%
Did not sustain a concussion	45	79%

**Table 3:** Survey respondents and concussions.

### Hypothesis 1

Hypothesis 1 sought to determine if there was a relationship between college athletes sustaining a concussion and concussion management through the consumption of the media portrayals of these traumatic brain injuries to investigate their effects. A chi square test of independence was used to determine that there was a statistically significant difference between the two (chi-square (1) = 4.275, N=57, p<.05) [36]. Therefore, there is a relationship between college athletes sustaining concussions and concussion management through the consumption of the media portrayals of these traumatic brain injuries to investigate their effects. The results of the chi square test are listed in Tables 4-6.

		Sustained Concussion		Total
		No	Yes	
Researched Concussion for Concussion Management	No	33	5	38
	Yes	12	7	19
	Total	45	12	57

**Table 4:** Crosstabulation for college athletes sustaining concussions and researching concussions for concussion management.

	Value	df	Asymp. sig. (2-sided)
Pearson chi-square	4.275	1	0.04
Likelihood ratio	4.07	1	0.04
N of valid cases	57		

**Table 5:** Chi square tests for college athletes sustaining concussions and researching concussions for concussion management.

		Value	Approx. sig.
Nominal by nominal	Phi	0.274	0.039
	Cramer's V	0.274	0.039
N of valid cases		57	

**Table 6:** Symmetric measures for college athletes sustaining concussions and researching concussions for concussion management.

Let  $p_1$  denote the proportion of all athletes who have suffered a concussion and have researched the literature for concussion

management. Let  $p_2$  denote the proportion of all athletes who have not suffered a concussion and have researched the literature for concussion management. The hypotheses are:

$$H_0: p_1 = p_2$$

$$H_A: p_1 \neq p_2$$

With a P-value = 0.039 < 0.05, the data rejects  $H_0: p_1 = p_2$ . The data supports  $H_A: p_1 \neq p_2$ .

Based on this data, it is believed that these proportions differ. The researchers estimate the difference with a 95% confidence interval. That is, the researchers are 95% confident that the value of  $p_1$  minus the value of  $p_2$  is a number in the interval (0.93% to 62.41%). The data supports the belief that  $p_1 > p_2$ . The difference might be very small (as small as 0.93%), or very large (as large as 62.41%), or anywhere in between.

Media Vehicle	Total	Percentage
Internet		51%
Television	4	11%
Radio	0	0%
Newspaper	2	6%
Web video	3	9%
Social media	3	9%
Magazines	4	11%
Blogs	0	0%
Articles	1	3%
Total	35	100%

**Table 7:** Media Vehicles Used By Athletes to Research Concussions for Concussion Management

### Hypothesis 2

Because 19 college athletes researched the effects of concussions, the media vehicles used for concussion management research is important to know. Table 7 lists the media vehicles utilized by college athletes when researching information pertaining to the long-term health effects of concussions. By far, the Internet was the most popular form of media (51%) used by college athletes.

It is noteworthy to mention that of the 19 college athletes who researched the long-term health effects of concussions, 18 or 94% of the survey respondents utilized the Internet. Without a doubt, college athletes are using new media vehicles (defined as the internet, social media, blogs, and web video for purposes of this study) at higher rate to study the effects of concussions as compared to that of traditional media vehicles (defined as television, radio, newspapers, articles, and magazine for purposes of this study) for concussion management. Respondents used new media vehicles 69% as compared to traditional media vehicles at 31%.

### Discussion

As noted, a relationship between college athletes sustaining concussions and concussion management through the consumption of

the media portrayals of these traumatic brain injuries to investigate their effects was found. This finding suggests that the effects of the media may not be minimal as suggested through the theories used as lenses to view the research. Also, it may be inferred that by encouraging athletes to seek out information regarding concussions may increase their awareness of concussion management.

The survey results indicate that college athletes utilized the Internet at 51% for their concussion research as compared to the other categories that received 11% or less of the distribution. Since college athletes used new media vehicles at a considerably higher rate than traditional media vehicles, an argument can be made that new media vehicles should be used to educate college athletes about their long-term health and that two-step flow theory may be a lens through which to view the issue. Baran and Davis [31] noted that that information from the media is shared by opinion leaders who provide information to followers, and this theory is arguably how social media is driven.

The researchers suggest that colleges and universities implement a pre-season information session for college athletes focused on concussions and the long-term health effects thereof. This pre-season session would occur before each and every season and could take the form of a webpage on the institution's website where the athlete logs in, reads a concussion article, watches a concussion video, and takes a 10 question survey about the information relating to concussions and future effects on one's health. By reinforcing the message on a yearly basis, college athletes may become better informed about their future health through concussion management. Colleges and universities in turn would be taking a proactive step in the dissemination of this important information.

Future research examining the media tools in which information regarding concussions is communicated to athletes may reduce the number of concussions suffered by college athletes. A special effort should be made to identify which forms of media are most effective in creating concussion awareness for proper management, and this effort should include traditional forms of media (radio, print, television, Internet) as well as non-traditional forms (social media). Further research should be conducted to identify which types of media students would prefer to utilize and consume to obtain information about concussions and management thereof.

This research opens the door to several future research topics. The results of the study suggest that students are not actively seeking media content regarding concussions. This phenomenon should be examined. Also, this research may suggest that student athletes who do not engage with media content regarding concussions are less likely to sustain a concussion than those student athletes who do engage with such content. This finding may negate efforts to create awareness for concussion management with student athletes and should be examined further.

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