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The Fall of the Gladiators: Wives' Tales of Concussion Reporting and (Possible) Progressive Neurodegenerative Disease in NFL Players

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Abstract

This study aims to uncover and describe stories of progressive cognitive, emotional, and behavioral decline in NFL players, as told by those who may know them best: their wives. The goal of the study was to simply explore and understand this new phenomenon with a group of individuals who had not yet been asked to voice their experiences. For this qualitative study, we conducted interviews with 20 wives of current and retired NFL players. Through thematic analysis of the wives' narratives, we identified four themes that help to describe the wives' attitudes and experiences. These were (a) Husbands' Willingness to Conceal Concussions, (b) Husbands Become Unrecognizable, (c) An Emotional Toll on Wives and Families, and (d) Frustrations with the NFL. Our interviews provided vivid, emotionally charged descriptions of both men and women whose lives were irrevocably altered, presumably by a concussion history related to the game of football.

Keywords

Concussion, Football, NFL, Wives, Progressive Neurodegenerative Disease, Chronic Traumatic Encephalopathy (CTE), Brain Injury, Thematic Analysis

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The Fall of the Gladiators: Wives' Tales of Concussion Reporting and (Possible) Progressive Neurodegenerative Disease in NFL Players

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This study aims to uncover and describe stories of progressive cognitive, emotional, and behavioral decline in NFL players, as told by those who may know them best: their wives. The goal of the study was to simply explore and understand this new phenomenon with a group of individuals who had not yet been asked to voice their experiences. For this qualitative study, we conducted interviews with 20 wives of current and retired NFL players. Through thematic analysis of the wives' narratives, we identified four themes that help to describe the wives' attitudes and experiences. These were (a) Husbands' Willingness to Conceal Concussions, (b) Husbands Become Unrecognizable, (c) An Emotional Toll on Wives and Families, and (d) Frustrations with the NFL. Our interviews provided vivid, emotionally charged descriptions of both men and women whose lives were irrevocably altered, presumably by a concussion history related to the game of football. Keywords: Concussion, Football, NFL, Wives, Progressive Neurodegenerative Disease, Chronic Traumatic Encephalopathy (CTE), Brain Injury, Thematic Analysis

Introduction

A 2017 study noted that 99% of National Football League (NFL) player brains autopsied showed hallmark signs of neurodegenerative disease (Mez et al., 2017). The longer their career, the higher the likelihood players suffered from some type of progressive and residual cognitive, emotional, or behavioral decline. In 2013, the NFL adopted a new concussion policy. It also settled a class action lawsuit that could pay out as much as \$1 billion to former players who can prove they suffer from brain disorders related to their professional football careers (Maese, 2018). Even with a seemingly swifter public response toward concussion, including implementing protocols that mandate professional football players be evaluated by both team and independent neurological consultants following all suspected concussions, the NFL continues to receive criticism as more former players are publicly profiled as victims of progressive neurodegenerative diseases (PND) related to their football careers, including chronic traumatic encephalopathy (CTE).

Purpose of the Study

While objective scholarly research continues, there is a noticeable gap in the literature related to subjective exploration of the symptoms and behaviors associated with PND. No known studies to date have explored this phenomenon from the perspective of the victims' loved ones. This article hopes to help fill that gap by presenting an interpretive phenomenological examination of the attitudes and experiences of a group of NFL wives

relative to the cognitive, emotional, and behavioral decline experienced by their player-husbands. Such decline may or may not be related to concussion history associated with playing professional football and/or to PND, such as CTE.

This study is a continuation of a previous study by Faure and Casanova (2018) that explored the potential prevalence of undiagnosed concussion to NFL players. That study reported the observations of NFL wives related to the actual or possible concussive experiences of their spouses. More than 98% of NFL wives acknowledged having observed a commonly identified symptom of concussion that each wife contended was the result of their husband sustaining *a blow to the head, neck or face, or elsewhere on the body with an impulsive force transmitted to the head (such as a hit to the upper body that caused a whiplash effect) while playing in the NFL which was either not diagnosed as a concussion or not reported to team officials*. 86% were aware of instances in which their husbands continued to play despite feeling concussed. In many cases, the symptoms the men experienced were recognized by their wives as being *severe*. Wives reported the symptoms as lingering for weeks, months, or sometimes years. More than 70% of the women said symptoms manifested into permanent disability involving severe memory loss, irritability, depression, and emotional instability (Faure & Casanova, 2018). While the Faure and Casanova study was limited to a relatively small sample of NFL wives, its results supported previous claims that concussion in the NFL may be underreported (Meehan, Mannix O'Brien, & Collins, 2013), as may be the prevalence of lingering symptoms (and possibly PND) in retired players. To date, no other known studies investigating sports related concussion (SRC) have relied on information provided by family members of professional athletes. Our hope for the current study is to provide a holistic, descriptive account of the attitudes and experiences of those NFL wives who either have or still do live with men who exhibit symptoms commonly associated with PND.

Literature Review

Given the lack of research specifically related to the attitudes and experiences of family members of athletes who have experienced SRC and subsequent PND, this literature review will focus on (a) the mechanisms and pathophysiology of concussive injury, (b) the characteristics of progressive neurodegenerative diseases, and (c) the effect of traumatic brain injury on family members.

Mechanism and Pathophysiology of Concussive Injury

Synthesizing what is known about SRC, a panel of the world's foremost authorities on concussion (known as *The Concussion in Sport Group*), relayed that SRC is a traumatic brain injury induced by biomechanical forces (McCrory et al., 2017). Concussion can be caused either by a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head. It typically results in the rapid onset of short-lived impairment of neurological function. Since the disturbance is functional not structural, and since the physiological damage occurs at the cellular (axonal) level, standard neuroimaging tests are inconclusive. Symptoms tend to resolve spontaneously, however the time for onset of symptoms varies from minutes to hours. Neuropathological changes may also develop, and healing typically follows a sequential course. In some cases, symptoms are prolonged (McCrory et al., 2017).

Conservative estimates project more than 300,000 SRCs occur each year, however, it has also been estimated that 30% to 50% of all concussions go unreported (McCrea, Hammeke, Olsen, Leo, & Guskievicz, 2004; Meehan et al., 2013). An American Academy of Neurology (2016) report projected 40% of all retired NFL players showed pathological signs of some type

of traumatic brain injury. Guskiewicz et al. (2007) contended retired NFL players who sustained three or more concussions had higher rate of mild cognitive impairment diagnosis and an increased threat of clinical depression. In their systematic review of more than 3800 research studies, Manley et al. (2017) also suggested that multiple concussions appear to be a risk factor for cognitive impairment and mental health problems in some individuals.

Characteristics of Progressive Neurodegenerative Diseases

PND are incurable and debilitating diseases caused by damage to the neurons of the brain. As nerve cells become progressively damaged, victims may experience problems with movement (ataxis) and mental functioning (dementia). Examples of PND include dementia, Parkinson's, Alzheimer's, amyotrophic lateral sclerosis (ALS), and CTE (Lehman, Hein, Baron, & Gersic, 2012).

Harrison S. Martland (1928) was the first to describe the clinical, neurological effects of sports-related, repetitive head trauma. Martland classified the condition experienced by a group of former boxers as *punch drunk syndrome*. Since Martland's report, our understanding of repeated head trauma and its effect on brain function has evolved. Terms used to describe the neurological syndrome of prolonged effects have included *traumatic encephalopathy* (Parker, 1934), *dementia puglistica* (Millsbaugh, 1937), and *chronic traumatic encephalopathy*, or CTE (Critchley, 1957).

Brandenburg and Hallervorden (1954) continued with research of *dementia puglistica*. They described their autopsy findings of a 51-year old man who had boxed for ten years and later exhibited personality changes, sleep disturbances, memory loss, dysphagia, parkinsonism, and dementia. Their findings suggested the presence of early-onset Alzheimers disease was the result of excessive plaque buildup in the brain. Continuing the examination of neurodegeneration in boxers, Corsellis (1989, as cited in Saffary, Chin & Cantu, 2012) provided the following description of its clinical presentation:

The onset of CTE is insidious, and affected individuals first notice deficits in attention, memory, and concentration leading eventually to confusion and disorientation. Over time, the condition progresses to dementia, poor judgment, irrational behavior, depression, and lack of insight. In advanced cases, Parkinsonism may develop. (p. 356)

It was thirteen years after Corsellis' report that CTE was first theorized to be linked to the repetitive head trauma experienced in the sport of football. In 2005, Dr. Bennett Omalu and colleagues were first to report evidence of a possible relationship between concussion history and CTE in a former professional football (NFL) player (Omalu et al., 2005). That player, Mike Webster, had committed suicide after enduring years of severe depression and substantial cognitive decline.

CTE is now widely believed to be linked to repeated SRC (Geddes, Vowles, Nicoll, & Revesz, 1999; Jordan, 2013), but positive diagnosis of the disorder can only be provided after posthumous examination. While confirmed cases have been discovered in boxers, wrestlers, ice hockey players, and military veterans, American football players remain the most highly studied subgroup since Webster's death (Armstrong, McKee, Stein, Alvarez, & Cairns, 2017). Omalu et al. (2010) and Omalu et al. (2011) continued to advance our understanding of CTE, agreeing with Corsellis, Bruton, and Freeman-Brown (1973) that the general pathological characteristics associated with CTE include macroscopic degenerative changes. These included cavum septum pellucidum, generalized global atrophy (reduction in brain weight and size), thinning of the corpus callosum, scarring and neuronal loss of the cerebellar tonsils, and

ventricular dilatation. In his examination of former professional football players specifically, Omalu et al. (2010) also discovered excessive tau protein buildup on the brains of those who committed suicide after enduring severe depression and neuropsychiatric and cognitive impairment.

Corsellis' description of the clinical presentation of CTE has not changed much in the last 30 years. Stern et al. (2013) continued to purport that victims suffer from impairment of memory and executive function, behavioral changes, mood disturbances, and potential motor impairment. Researchers at Boston University (BU) are among those who have accepted this description along with the physiological descriptions provided by Corsellis, Bruton, and Freeman-Brown (1973) and Omalu et al. (2011). McKee, Stein, Kiernan, and Alvarez (2015) suggested CTE is best characterized as progressing in four stages: (i) headache, loss of attention and consciousness, (ii) depression, explosivity and short-term memory loss, (iii) loss of executive function and cognition, and (iv) dementia. As the severity of traumatic brain injury increases, so does the burden on family caregivers (Liu, Zhu, Liu & Guo, 2015).

Previous studies have suggested NFL players are at an increased risk of neurodegenerative disease. Lehman et al. (2012) reported the neurodegenerative mortality rate in professional football players as three times higher than that of the general US population. The mortality rate for those former NFL players with Alzheimer's disease and ALS was four times higher. In an effort to learn more about the objective presentation of various neurodegenerative diseases, especially CTE, BU created a *brain bank*. There, posthumous examination of the neuropathology and clinical presentation of donors' brains can be studied. Results have been convincing, with 99% of the former NFL players (and 79% of high school and college players) showing evidence of CTE. Remarkably, 85% of former NFL players showed severe pathological signs (Mez et al., 2017).

Effect of Traumatic Brain Injury on Family Members

While posthumous descriptions of football players victimized by traumatic brain injury (TBI) have been written about in the press, there is a dearth of information in scholarly resources related to the sociological impact of such diagnoses and the effect that subsequent behaviors have on loved ones. Existing literature related to this topic appears to be isolated to patients outside sport. Muir and Haffey (as cited in Liu et al., 2015) suggested that the grief family members of TBI patients feel is similar to what people feel when a loved one dies. They suggested that the psychological state of family caregivers is closely related to the patients' condition and often includes distress such as depression and/or anxiety (Ennis, Rosenbloom, Canzian, & Topolovec-Vranic, 2013). Duff (2002) and Mathis (1984) also studied the needs of family members of severe traumatic brain injured (TBI) patients. They found that families have extensive needs for information and emotional support while they struggle to deal with the uncertainty ahead and adapt to the ongoing changes in their lives (as cited in Keenan & Joseph, 2010). Less access to social support has also been shown to increase stress (Riley, 2007).

About the Authors

Both research team members are intrigued by the psychological and sociological aspects surrounding sport-related concussion. As a practicing athletic trainer and researcher, the lead author has used her professional stature as a university professor to help educate coaches, parents and athletes. In 2005, she started a *Concussion Awareness Campaign* targeting youth and high school sport programs within her state. Her actions led to increased concussion education across all levels of sport and the adoption of strengthened concussion management

policies. Legislative action soon followed. While policies targeting concussion identification and management have improved, the lead author still notices a lack of emotional support resources in place for victims' families and a continued disregard towards expanding educational programming to include family members of athletes stricken with long-term cognitive deficits related to concussion experience. As a doctoral student in Sport Psychology, the second author is currently exploring research interests related to the psychosocial aspects of injury and individual well-being. Although the physical recovery of an athlete is important, she believes the psychological and emotional components are also critical. This unique recovery process can affect more than just the injured individual and understanding the experiences of those affected is important. Thus, she feels gaining this vital insight can lead to more effective programs and consulting practices.

Methods

Epistemology

A researcher's epistemology is described as "a way of understanding and explaining how we know what we know" (Crotty, 1998, p. 3), or simply a philosophical worldview (Creswell, 2014). The interpretivist paradigm, or constructivist worldview, seeks to understand and generate theory (Creswell, 2014; Mack, 2010). Researchers who hold this view "seek understanding of the world in which they live and work and develop subjective meanings of experiences" (Creswell, 2014, p. 8). This research project was developed and constructed based on our interpretation of the wives' experiences. What we concluded has been influenced by the many conversations we had with the wives. We sought to understand the experiences and challenges held by many.

The theoretical perspective used to inform the research was thematic analysis. Thematic analysis offers an accessible and theoretically flexible approach to analyzing interview data. As Braun and Clarke (2006) explained, the goal of thematic analysis is "to identify themes, i.e. patterns in the data that are important or interesting and use these themes to address the research or say something about an issue" (p. 84). Braun and Clarke (2006) further explained two levels of themes: semantic and latent. Semantic themes present "surface meanings of the data [that] the analyst is not looking for beyond what a participant has said or what has been written" (p. 84). In contrast, latent level themes look beyond what has been said "to identify or examine the underlying ideas, assumptions, and ideologies that are theorized as shaping or informing the semantic content of the data" (p. 84). This study sought to understand and describe the experiences of wives and their NFL husbands, relative to concussion history. The goal of the study was to simply explore and understand this new phenomenon with a group of individuals who had not yet been asked to voice their experiences.

Participants and Sampling

With the assistance of a friend whose husband currently plays for an NFL team, we recruited participants by contacting members of a closed social networking website dedicated to current and former NFL wives. To gain access to the page, we reached out to the group's moderator via e-mail. Our lead author introduced herself, discussed her past research involving concussion, and relayed her interest in and objectives for the current study. The group's moderator first expressed hesitation to grant us access to the wives. She acknowledged receiving numerous requests from researchers and journalists each week to have access to the wives, but that she was hesitant to provide any outsider access to the site in order to protect the confidentiality of the group's members and their postings. Throughout several phone calls and

e-mails over the course of several weeks, we worked to build rapport with the moderator, and we provided numerous reassurances of our intentions. Because of this, and because our lead researcher had previously established relationships with several women in the group who could attest to our professionalism and intentions, the moderator agreed to grant us access. She posted our study description and encouraged group members to participate. When questions related to the study were expressed, the moderator relayed those questions to us via email and posted our responses verbatim. As a result, we were able to attract 20 women to participate in telephone interviews. These women represented wives of both current ($n = 6$) and former ($n = 14$) NFL players.

Instrumentation

When designing our interview protocol, we relied heavily on previously published media reports of former NFL players who were (or currently are) victimized by long-term brain damage (presumably as a result of their football experiences). We also consulted scholarly literature relative to the symptoms surrounding post-concussion syndrome and various forms of PND, including CTE.

We approached each interview using a semi-structured approach. We first introduced ourselves and explained our interest in the subject. We then asked the women if they were aware of instances in which they felt their husband was concussed, even though his team may not have been aware. We asked the women to explain the behaviors their husbands exhibited during these instances, and whether or not their husbands continued to experience signs of cognitive, behavioral, or emotional decline. Though we did not specifically ask for stories related to such decline, most of the women contributed detailed accounts that illustrated such decline. We asked each of the women what they knew about PND and CTE, and if they were fearful their husband would be stricken at some point. For those that were afraid, we asked them to describe any behaviors they recognized that might lead them to believe such a disorder could already be present. Finally, we asked the women what, if any, solutions they would have to address concussion and concussion outcomes associated with the sport of football.

Prior to the interviews, our interview protocol was reviewed by two content-area experts, approved by an Institutional Review Board, and pilot tested with three women matching the characteristics of our participants. These processes helped us to detect possible flaws in both our instrument and our interviewing process. For example, during our pilot interviews, we were able to practice and perfect our interviewing techniques and we began to understand what questions would elicit the most meaningful responses. From there, we became better prepared to respond with appropriate follow-up questions.

Procedures and Data Collection

Once we finalized our protocol, we reached out to all interested participants using the contact information they provided to us via a secure online survey and scheduled interviews at a time convenient for both parties. All of the interviews were conducted by telephone over a three-week period. Each interview was audio recorded and transcribed and then returned to each participant electronically within two weeks for validation purposes (Morse, 1994). Interviews lasted anywhere from 25 to 95 minutes.

Though we approached each interview with a pre-planned set of questions, our interviews became very conversational. Instead of strictly adhering to our script, we listened attentively to the in-depth stories we were being told and asked follow-up questions when necessary. We felt it was valuable to allow the women the opportunity to thoroughly describe their experiences and we benefitted from more robust descriptions, as a result.

Data Analysis

All verified interview transcripts were coded and the content was analyzed thematically. As researchers, we individually read and re-read (numerous times) the raw interview transcripts. We assigned preliminary codes to describe the content and then highlighted (using colored highlighters) key words, phrases, and patterns in the text, line by line. Our coding process also included memoing (keeping running notes on each of our recognized clusters), sorting the memos, conceptualizing and comparing each of the incidents in the data, and theorizing. Since this entire coding process was done by hand, it allowed us to more intimately comprehend the data we had collected (Denzin & Lincoln, 1998). Through this process, which was outlined by Thompson and Barrett (1997), we were able to inductively identify four themes and 12 subthemes. Because content analysis measures are useless without the establishment of reliability among coders (Neuendorf, 2002), we relied on a formula described by Miles and Huberman (1994):

$$\text{Reliability} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{disagreements}}$$

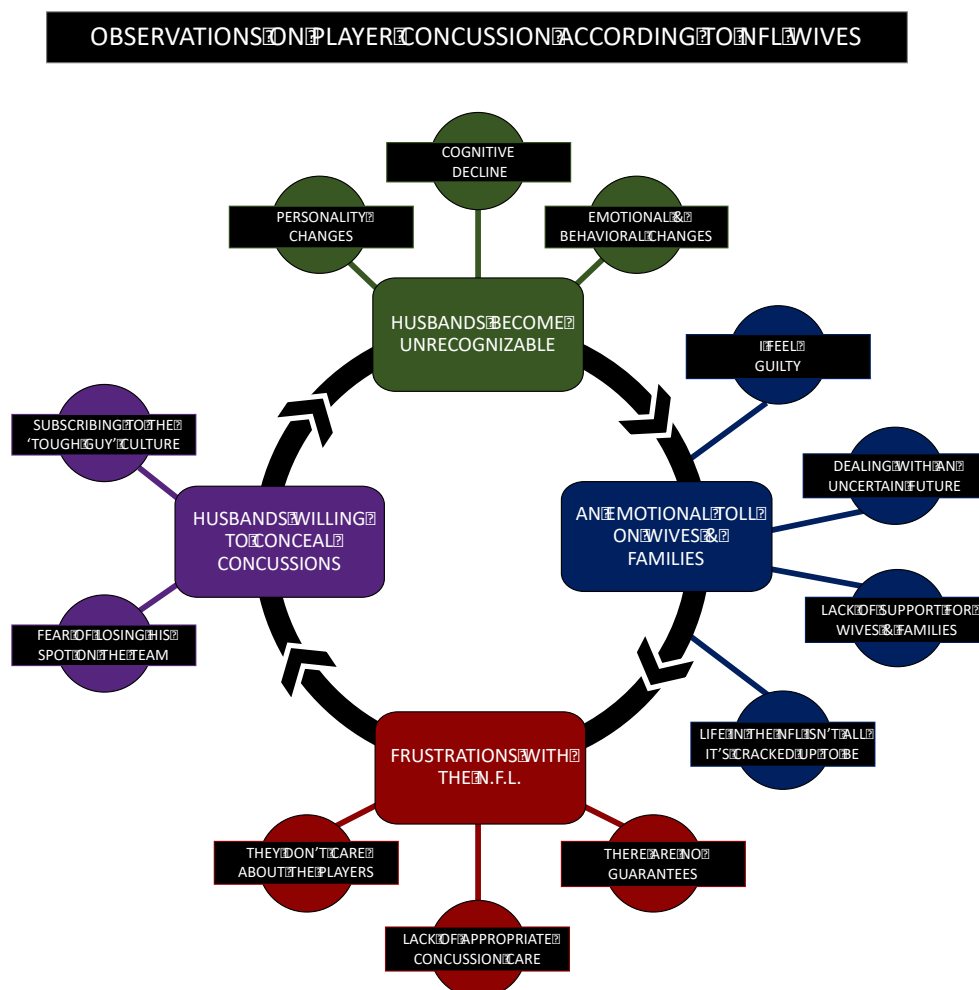
Based on this calculation, we initially reached 94% agreement on the themes and subthemes identified and we reached 100% consensus upon the second iteration. This number assured us we had mitigated the likelihood of interpretive bias (Miles & Huberman, 1994).

We knew the vetting process that protected the identity of our participants, and the identity of their husbands was critical. We ensured confidentiality at three points during the research process: data collection, data cleaning, and dissemination of research results. This convention of confidentiality (Baez, 2002) included assuring all participants that any identifiable characteristics they revealed (such as the names of their husbands or other NFL players, or the names of NFL teams) would be omitted. Then, during the interview transcription, we ensured a clean data set by removing and replacing any identifiable information with pseudonyms. We felt strongly that assigning fictitious names to each participant was more valuable than merely assigning a code number because it would help reinforce to our readers that our participants were humans with authentic stories to tell. We also felt using pseudonyms would assist readers in following individual narratives. Such practice is routinely used in qualitative research involving interviews, especially when sensitive information is obtained (Saunders, Kitzinger, & Kitzinger, 2015). Following the recommendation of Biddle, Markland, Gilbourne, Chatzisarantis, and Sparkes (2001), we presented our findings using both hierarchical content trees and direct quotations so that our readers could be provided with an opportunity to evaluate and interpret interview data in a way most meaningful to them.

Results

As stated, 20 women agreed to be interviewed. We identified four themes and 12 subthemes that described the attitudes wives had towards football and their experiences related to actual or possible PND in their husbands (*Figure 1*). The overarching themes consistent with previous research and were identified as, (a) *Husbands Willing to Conceal Concussions*, (b) *Husbands Become Unrecognizable*, (c) *An Emotional Toll on Wives and Families*, and (d) *Frustrations with the NFL*.

Figure 1. Thematic Analysis



Husbands Willing to Conceal Concussions

The wives acknowledged their husbands' willingness to conceal concussion and pointed to a culture that rewards being tough and the players' fear of getting cut as the cause. This theme is consistent with previously published reports that purported that "[NFL] players, many of whom are lavished with public attention and widespread praise, are...compelled to demonstrate appropriate masculinity by returning to play and, moreover, by continuing to be dominant, aggressive, and physical on the field despite pain or injury" (Rodgers, 2014, p. 154). Like the other women, Ella explained that her husband "fully believed that if you got your bell rung, you were not tough if you didn't get back up and get back in." In fact, nearly every single woman in our study told us their husbands would continue to play even if they had known more about the risks. Some, like Chloe, told us they felt more high-profile players would probably be freer to report the injury, but the majority were not as comfortable. The women pointed to two primary factors that influenced their husbands' willingness to conceal concussion: a desire to prove how tough he was, and a fear that if he didn't not display such toughness, he would be cut from the team.

Subscribing to the "tough guy" culture. Toughness has long been associated with the culture of the sport of football. The wives clearly understood that culture as a pre-requisite of

the job. “The players shouldn’t be worried about losing their job or reproach if they report that they have an injury such as a concussion, but they are,” a wife of a current player, Patti, told us. “If they are labeled soft by a team, they will have no future in the NFL.” As Rodgers (2014) previously reported, professional football players’ understanding of their bodies “leads to a disconnect between the emotional and physical self, including a repression of pain and other “weak” or feminized emotions such as fear or anxiety” (p. 147). In our study, Anna hinted that the decision was even deeper than that:

They’re supposed to be tough right? They are supposed to be tough. That is what an NFL player is. If you’re not seen as tough in the locker room, you are not going to make it, you are not going to last. You keep your mouth shut, you do not say anything. It’s sick, it really is.... But when you’re a husband, when you’re a good man, and you’re a father... and you’re the breadwinner, your job is to take care of your family. And this is how you make a living for your family. You’re going to do everything you can to take care of your family. And you’re going to work hard. You’re a man. You are tough. You are strong.

Fear of losing their spot on the team. Many of the wives, including Anna, contended that “every player in the NFL is afraid to tell their team about an injury.” This was said to be true by both wives of retired and current players. Anna said that was because “They can cut you at any second. They do not care about you. You are a number. You are not a human being.” Other wives agreed with Anna’s description of the NFL’s callous attitude toward players. They understood that if their player-husbands’ reported injuries, they would not play. If they did not play, they would not get paid. “[My husband] got knocked out in the first half and played in the second half because if you don’t play, you don’t get paid, and you get replaced,” Olivia explained. Those sentiments were shared by most of wives we spoke with. The wives knew their husbands were the *lucky* ones who filled one of those 53 seats on their respective NFL team’s roster. For each of those players, there were hundreds of others waiting in the wings for an opportunity. Keisha reminded us, “With each new season comes a new group of young kids they can entice with money and fame.” Concussion was thought to be the most taboo of all injuries due to the injury’s uncertainty. Of concussion, Anna concluded, “they’re not going to have that documented anywhere. There is no way they are going to say that. It’s something you learn and pick up really quick if you want to play in the NFL.” Felicia, too, spoke to the mindset of many players:

You beat at the brain before it’s ready to start learning what consequences are.... What happens is that you take a kid and put money in his hand and you give him all the adulations. *Yay! Rah! I’m accomplished! I’m achieved! I’m on top of the world! I’m the Shit!* You know? How do you compete with that? You know what? You don’t.

Regardless of the inherent risk and their husbands’ “warrior” persona, most of the women agreed they “could never ask him to give up something he loved” (Rebecca).

Husbands Become Unrecognizable

A common theme through the various narratives of the wives was their reference to their husbands becoming unrecognizable either during or after their football careers. The women witnessed their husbands undergo personality changes, experience significant cognitive, emotional, and/or behavioral decline. They attributed these changes directly to a

history of head trauma experienced in the sport of football. Such changes are consistent with the findings of Martland (1928), Parker (1934), Millspaugh (1937), Critchley (1957) and others, all of whom described a neurological syndrome of prolonged effects associated with repeated concussion.

Personality changes. The wives of retired players, especially, described to us how their husbands had changed after their football careers ended. They attributed these changes to their husbands' concussive history. Many, including Gabrielle, commented that as years progressed following retirement, they only saw "glimpses" of the men they used to know. Wendy elaborated further, telling us "Sadly, all my fears are reality." She told us her husband, who played in the 1980s and is now retired, was always afraid to report being concussed because he knew he would lose his job. Like nearly a dozen of the other wives, Wendy said her husband is still in denial:

He won't even admit there's a problem with concussions as a whole even with all the evidence. He gets so angry if I even mention the issue. I've become the enemy because I tell him he needs help. And a lot of people in his professional circles won't notice the problems. But those closest to him live with the consequences and would probably sound like liars if we spoke about it in public. But I know what I know. He is not the man I married. And sadly his children will never meet that man.

Perhaps the most moving story came from Ella. Of her husband, she told us,

E: He was a family guy who loved his family.... His whole social life was his family. He paid a fine every night. He walked in and checked in for dinner, and then left and ate with us every night during training camp because family dinner was *that* important to him.

I: And who did he become?

E: He became a man that never spoke to any of the four of us again.

Ella's husband played eight years in the NFL. He died fifteen years after his football career ended. He was one of the dozens of players who were posthumously diagnosed with CTE. She told us "there were so many things that we looked back on that were little symptoms that we weren't aware and then once the big symptoms came, it was out of control quick." Like several of the other husbands of women in this study, Ella said her husband went through a complete personality change in his final years. She told us, "He turned into an angry, man. He hated everybody. He was pissed at God, and he was very religious guy before." Like other women we talked to, Ella's husband eventually left her and her children and lived a random, transient-like existence. Ella explained that throughout the years that preceded her husband's death, she tried to rationalize his erratic behavior by chalking it up to a "mid-life crisis" caused by his own separation from football and his inability to identify as anything other than a football player. "I wanted to believe that's what it was because people who have midlife crises get their act together, and I wanted to believe that he would come home," she told us. So she just waited, heartbroken. "Two years into it my kids were like, "Dad's never coming home. You have to move forward." But I refused. It separated my kids and I for a little bit because I was still defending him." Despite the obvious hurt caused by the separation, Ella, like some of the other women we talked to, found comfort in her husband's death, and in his eventual CTE diagnosis:

He died still standing. It's just that he wasn't around the ones he loved the most. I knew he didn't forget us. That was all we had. But, he was broken, sad, and scared. When he would come back he was terrified... It was crazy what we were living. I can't even describe it. It sounds weird to say happy, but I was so *happy* that the man I knew was the man I knew, and this end result was not my soulmate. I don't know who *that* was. But [name of NFL player-husband] *was* who I loved. He was this great guy that I was proud to be married to. That wasn't him in the end.

Cognitive Decline. Diedra's husband has been retired for ten years after playing in the NFL for nine. He is in his forties now and has been diagnosed with cognitive impairment. She said he experiences great difficulty with simple tasks, including thinking and memory. He is often confused, and he lacks the ability to concentrate for extended periods. Diedra told us traveling was especially hard on her husband, and that she has to help him organize his day-to-day activities:

He forgets things all the time. Right now he's on total and permanent disability. The NFL granted that [because] he has severe depression and anxiety.... His world has to be pretty small, and things have to be very simple for him. He goes to bed early, and gets up kind of late, not really late, but late considering what time he goes to bed. He usually needs a nap during the day. And he is maybe able to go to two places. He does go to the gym and does a little workout. He is in recovery so he so he also goes to A.A. meeting several times a week. Any travel, anything outside of that will wipe him out for a good week. He just can't handle very much.... He can't remember people's names. I have to set up and handle most of his doctors' appointments and keep him on track with things.

Gabrielle told us her husband was an Academic All-American in college and "a man who could play *Jeopardy* and beat everyone in the room." But in recent years, even the simplest tasks have become overwhelming. She told us about an instance in which their daughter asked him to help her spell the word *surprise*. "He was like, S-U-E-P-R-I-S-E," she said. She told us cognitive tasks like that "agitated" her husband. She described,

His brain cannot process things at the speed that it used to process. If information is thrown at him too quickly his brain starts, like, short circuiting. And then there goes the temper.... It's so sad to watch him deteriorate.

Wives of current players were already seeing evidence of cognitive decline. Hayley, whose husband is in his mid-twenties and starting his fourth year in the NFL, said she noticed "his memory and hearing are getting really bad." She said her husband had never been "diagnosed" with a concussion throughout his football career (high school, college, or pro), and that he "is too young to be experiencing these symptoms with frequency."

Emotional and behavioral issues. Numerous wives told us their husbands now rely on "pretty serious medications" (Diedra) to try to control their severe depression and anxiety. Ongoing anger, alcoholism, and mood swings were also frequently cited, as were suicidal tendencies. Brooke told us about her husband's progressive decline in recent years. She told us stories about her husband being "knocked out cold" when he was playing, only to have "smelling salts" wiped under his nose by the team's medical staff to wake him up. Within

seconds, he was “patted on the ass” by his coaches and told to “get back on the field.” She said she has watched closely as friends and teammates of her husband, who is currently in his mid-forties and played in the 1990s and early 2000s, have declined rapidly, with “probably five or six who have committed suicide.” Her husband has been retired for ten years now and already showing signs of deterioration, himself:

I see it plain as day, and my children see it plain as day. He might want to hide it from other people, but it’s very, very evident what we are dealing with.... I know for sure the paranoia, the rage, and the drop-of-the-dime being angry over something ridiculous and not being able to control his emotion, the depression, alcoholism, and dependency on things. He’s that to a T.

Multiple wives reported emotional outbursts by their husbands that led to alienation between the men and their children. Gabrielle was one of those. She said it was tough to explain to her young daughter why her daddy, who was always so loving, was all-of-a-sudden so mean:

You know he, um, they say things they don’t mean. He’s called her a fucking idiot and he has called her names. I look at her, and say, “Listen. He is right about what he is saying, you shouldn’t have done *x*, *y*, and *z*, but his delivery he got an F on. He got an A on why he is upset, but a F on his delivery. I’m so sorry, forget that he called you that.” It’s like I’m constantly doing damage control.

The Emotional Toll on Wives and Families

It was abundantly apparent that fears about concussion took an enormous toll on the wives and their emotional well-being, just as Muir and Haffey (as cited in Liu et al., 2015) suggested. The women we interviewed moved us with incredibly descriptive accounts of the ways in which concussion has affected both them and their husbands. At least three of the women we interviewed were married to former NFL players who were posthumously diagnosed with CTE. Regardless of a previous history of diagnosed concussion to their spouse, these NFL wives were scared, especially of the unknown. Cognizant of the stories surrounding some concussion prognoses, they lived their lives anxiously waiting for their husbands to experience personality changes, exhibit violent tendencies, lose cognitive abilities, or become otherwise unrecognizable. Wives of retired players, especially, shared common stories of progressive cognitive, emotional, and behavioral decline in their player-husbands. The emotional toll on wives who became part- or even full-time caretakers was excruciatingly painful. These women were highly critical of those wives of current players who remained steadfastly optimistic about the NFL’s efforts to control concussion incidence, and who they felt naively operated under the belief—or at least hope—that it would not happen to them.

We identified numerous keywords and phrases that kept reappearing in the interview transcripts within our theme of *The Emotional Toll on Wives and Families*. From these, we determined four subthemes. These were labeled, (a) *Fear of the Future*, (b) *Self-Guilt*, (c) *Lack of Support for Wives and Families*, and (d) *Life in the NFL Isn’t All It’s Cracked Up to Be*.

Fear of the future. The wives’ fears related to concussion were profound. Several words and phrases kept reoccurring relative to what the future might hold. Even wives of current players expressed concern. Vicki told us she was “petrified for our future, even though [her husband] hasn’t had any officially documented concussions.” Chloe added,

What is our life going to look like after the NFL? Is he going to be able to enjoy his retirement? Is he going to be able to participate in sports with our boys, or you know am I going to be having to handle everything on my shoulders. I don't know, I want him to enjoy it, I want us to have fun, but I also want him to be healthy. But I just, it makes me worry. Talking to other wives whose husbands have been retired and just kind of seeing what their family life is like after the NFL, it just, I don't know, it definitely makes me worry.

The risk of CTE was discussed frequently and was central source of fear. The wives recounted stories of Webster, Seau, and Aaron Hernandez, the former New England Patriots' tight end who was convicted of murder and who hung himself in his jail cell. While this study was being conducted, it was revealed Hernandez' brain also showed evidence of advanced-stage CTE (Belson, 2017). The women contended the discovery was "sad" and "sobering," but "not surprising." Currently, CTE can only be diagnosed with certainty by post-mortem examination (McKee et al., 2015). Though there has been a focused effort on early detection of the disease in recent years, the thought of early diagnosis was not something that comforted the wives. As Ella stated, "Even if you diagnose it early, and even if you know they have the symptoms, you can't stop it. It spirals out of control."

Guilt feelings. The lives of many of our participants revolved solely around their husbands. As caregivers, they often expressed guilt over things they should have done in the past to protect their husbands from the reality they experience today. Several of the women recounted the mental exhaustion they felt from watching their husbands struggle while knowing they could not tell anyone about it. "You know what you do, you put on a smile and you act like everything is ok, but it's not," Anna told us. Many of the wives told us they were hopeful to resume their own aspirations after their husbands' retirement, but then found themselves in a role as either part-time or full-time caretakers of their husbands. One of those was Diedra:

It's a real struggle. I just work part time right now. And I feel guilty working part time, that it's taking away too much because of how much he needs me to help him. And you know, I just can't imagine how it's going to be 5-10 years from now, what this is going to look like.... I work mostly so that we can have health insurance, because my job thankfully offers that for working part time.... There is a lot I want to do. I would love to go for a hikes. You know, [there are] so many great things, ideas, and things that the kids want to do. And my husband can't be included in all of it. Being a caretaker takes its toll, but I love him so much. In so many ways we are really blessed. We are. It's just, ... our life is very different than most of our peers.

Dealing with the progressive decline, especially with their husbands' behavioral changes, was challenging. Gabrielle told us she continues to live with the guilt of knowing she hasn't always understood what her husband is going through:

I guess I was so angry I couldn't see it. I had so much anger and hate towards him to see that he was sick and see there was an issue. I blamed it all on the alcohol - for him being that way - when really the alcohol was his way of getting through the pain.

Felicia, another widow whose husband was confirmed with advance-stage CTE, added,

I've got this depression now that I know stems from a lot of what was going on, the unresolved anger, the unresolved guilt. You know, I'm always going to have this guilt because of what took place. But I've had to really try to forgive myself for not understanding.... The repressed anger, I'll just swallow it.

Empathy was also common. Anna explained,

I think that sometimes we hurt more than they hurt. When they get hurt, whether they're playing or not, I think we take on more than even they do emotionally because we love them so much and [as women] we're obviously very emotionally creatures.... I sit here and feel bad because I wouldn't have been able to build a house had my husband not played in the NFL, and I'm so thankful for that. My husband, you know, he was always the 53rd man on the team. And I'm thankful, you know? He got to play 7 years, and even played in a Super Bowl.

Lack of support for the wives and families. Nearly every woman who participated in this study pointed to a lack of social support as a significant source of stress for both them and their husbands. Through stern warnings from their husbands and from others associated with the NFL, these women were conditioned not to trust anyone and not to talk with anyone about their husbands' concussive experiences. This was even more true once their husbands retired. Thus, the wives lacked a much-needed network of social support.

Our conversations revealed so many stories of cognitive, emotional, and behavioral decline that we felt it was important to ask the wives about their views on and experiences with the NFL concussion settlement. Four of the women were widows of men named in the class action lawsuit, though none had yet received support payments from the League, despite providing clear evidence of their husband's posthumous CTE diagnosis. We were surprised to learn from several other wives that their husbands did not want to discuss the concussion lawsuit with them because the men remained steadfastly loyal to the sport and to the League. This despite their present, impaired condition. We were even more surprised to learn that several wives had signed their husbands' names to the class-action suit without their husbands' knowledge. "I need to be covered if something is going to happen to him," Brooke told us. Ella said the same but acknowledged that she was not optimistic that she would see a payout. "I'll die before they deal with this concussion settlement," Ella told us, recounting the story of her repeated attempts to get the League to acknowledge examining physicians' diagnoses of her husband. Meanwhile, Ella, Anna, Brooke, Gabrielle, and Felicia all had friends (former teammates of their husbands') who were also suffering from lasting brain damage with no access to health care. "It's bankrupting their families," Ella told us. "I just cry for them," Anna added. "What their husbands are going through, it's *so* scary."

NFL life isn't all it's cracked up to be. It was evident that the wives of NFL players we spoke with were thankful for the lavish homes, cars, and clothes most were able to have, but they were quick to point out that they would trade it all for healthy husbands. They were all-too-familiar with the stereotypes that surround them, and they were critical of others who felt the money their families had erased any struggles they endured. Brooke told us about her "roller coaster" life that looks more glamorous than it is. "It's not all it is cracked up to be," she proclaimed. Diedra told us about her husband's two Super Bowl rings, their bonus room full of jerseys and photos, and the myriad of experiences they had throughout their NFL career:

[Playing in the NFL] was a very small part of a very big life. You know he can't play with our kids anymore, and he really has a hard time being motivated if he could physically play with them. He has very little patience for them. He doesn't work and hasn't for a couple years now and he is only 45. And the kids struggle with that, why dad doesn't work. Dad's always grumpy. But they love their father, and he does the best that he can.

Anna described to us that when they (she, like many of the wives, always referred to her husband's NFL career as *hers*, too) were drafted into the NFL, the risk of concussion was not publicized, and virtually nothing was known about the long-term risks associated with repeated head trauma. She spoke highly of the cities they traveled to and lived in, and the people they met. But when it came to the rest, she spoke only of her fears. "I've always said that the NFL, for at least our experience, is 90% horrible, stressful, and awful and 10% amazing," she said. "And that 10% is what fueled me through every off season, to say ok I can do this again."

Anna's husband retired three years ago after playing for seven years in the NFL. She stated her husband is already starting to show signs of cognitive impairment, and suffers from "severe, *severe* depression" that she terms as "almost suicidal."

People have this perception that if you are in the NFL your life is made, that you're a millionaire and that you have no problems, and that everything is perfect. And if it isn't, that you have the money so it's ok. As a NFL wife and a NFL family, the only people that I can talk to about this are our fellow NFL people. And it gets harder when you retire.... These men go through their entire career from you know high school, college, to the NFL, they have their locker room. They have their built in hanging out with their boys, their comradery. My husband said to me, "you know I have been told what to wear, what to eat, what time to go to bed, what time to be everywhere, until I was 30, almost 31 years old and then it's just, snap your fingers and it's gone and you are left wondering, am I going to play anymore? Do I keep working out? Is someone going to call me? Is someone not? How do I know when it's over? I don't want it to be over. I feel like I'm in the best shape of my life." But these guys go from having all of that and then, they're not necessarily going to be living in the city that they last played in. That's not their home, most people are not living by their friends now. So they're not talking to them on a daily basis anymore. And they have kids now, and different jobs so life gets in the way. So these guys are not talking about anything, they are keeping it inside...All these things that are caused by these concussions, the rage, the depression, the suicidal thoughts and all of that, I think all of that, they have because they're not getting it out there. They're not able to talk about it. That is hard.

Sabrina added,

My husband is 47 and afraid to death of his declining mental capacity. There are changes to his personality, mood, health that he feels powerless to change. The other day we had a conversation about what I am to do if he starts to change to such a degree that we cannot take care of him. He is the only male in a house of 4 daughters and me. At times he is loud, angry, aggressive. We are afraid but love him too much to not support him through this. Football gave us a great lifestyle. We have been afforded a lot of nice opportunities and things, but I don't think the effects are worth it. There's just too much risk on the line.

Frustrations with the NFL

Even while acknowledging their husbands' stubbornness to continue to play while symptomatic, the players' wives placed great blame on the NFL for their disregard of player health and safety. We grouped the wives' narratives into three separate subthemes: (a) They Don't Care About the Players, (b) Lack of Appropriate Concussion Care, and (c) There Are No Guarantees.

They don't care about the players. The business model of the NFL seemed to control the way concussed players, especially high-profile ones, were treated. "It's a huge business all about money," Natalee contended. "They are more interested in protecting their brand," Leila added. Some wives conceded that if the NFL took concussion too seriously, it would lead to a slow demise of the game. While recent publicity surrounding concussion has forced the NFL to act in a manner that publicly suggests it is taking a stronger stand against concussion, the wives of retired players, in particular, were critical. While most of the wives of current players were optimistic that the League could control the long-term risks associated with concussion, most of the retired players' wives were not. They cited the pressure players (still) have to play despite exhibiting or expressing symptoms and the lack of a long-term health care package similar to other pro sports as proof that the NFL does not care about players. The wives reported getting only five years of health care paid for following retirement *if* their husbands were lucky enough to be vested. Ongoing medical expenses were extensive for those that suffered from the long-term effects of concussion, or from conditions that could be associated with CTE. Chloe, the wife of a current player, told us,

I know that more than five years out he's going to be needing help medically and that's all that we get. I think that is pretty BS, that they put their lives on the line basically for this game and that's all we get afterwards, and that's when they're probably going to need it the most.

The anger wives of retired players had towards the NFL seemed particularly profound. Gabrielle said she was still "pissed off" about the papers her husband once received from the League stating there was "no evidence" that concussions were dangerous. Anna called the NFL "very shady" and contended they did not "care about these people, these men, they don't care about them at all, it is all about money." Brooke accused the League, especially Commissioner Roger Goodell, of repeatedly lying to players about concussion. Ella, too, expressed resentment towards her deceased husband's former employer. She said that even with her husband's passing, the League continues to control her life:

What I hate is that the NFL lies. They lie that they are helping, they lie that they care. I got a freaking medallion when my husband died, that is it. If I remarry, I lose all of our retirement that we put in. I can't remarry. They don't want to pay you anything. That is my money that is our 401K that we put aside for our kids to go to college and they still own me today, that's ridiculous.

Nearly twenty-five years out of her husband's retirement and almost ten since his death, no one seemed angrier than Felicia.

I am fucking livid with the NFL, *livid* with the NFL. I fault them, I fault them, I fault them! They play with lives. They put the dollars before the human being.... Yea, I'm bitter. I'm not going to lie.

Lack of appropriate concussion care. Across the board, the wives agreed that the way teams dealt with concussion needed to improve. The wives felt owners and general managers, coaches, and even doctors and team athletic trainers were all to blame for what they termed “a joke” of concern. Hayley was one of several wives of current players who told us she did not think the players were told how serious concussion is, “especially by the team docs,” she said. The League would “do anything” to keep the players on the field, Ann said. She also confirmed what we already suspected, that, “The players, they need to sit there and keep their mouth shut and put their head down and work hard. That’s it.”

Felicia recalled the way in which her husband was evaluated after a big hit that left him dazed, confused, and sometimes unconscious. “It used to be one of those things how many fingers can you see? Ok great you got the number right, whether they did or not.” She also told us team officials would keep her husband away from the media after such instances, too. That way, their negligent care would go further unnoticed.

The wives of those men who played prior to 2000, and especially those who played in the 1980s and 90s, were livid. Despite personally witnessing her husband exhibit significant symptoms following games throughout his career, including several instances that involved a loss of consciousness, “They never diagnosed him once,” Felicia told us. It was not just the wives of players from a decade or more ago that expressed concern. Anna was also flabbergasted by the lack of concussion diagnoses when her husband played, a career that spanned seven years and only ended in 2014:

You know my husband has one documented concussion in the NFL. One. *One* documented one. Now that I know what a concussion is, I know for sure *definitely* had more than just *one*.

There are no guarantees. The current NFL collective bargaining agreement only provides vested players with five years of health insurance after their retirement, and players’ whose careers lasted fewer than three seasons do not qualify for any subsequent care (Jenkins & Maese, 2013). By comparison, professional basketball, baseball, and hockey players are all provided with lifetime plans (Holdredge, 2011; NBA, 2016; Stinson, 2012). In other professional sports like baseball and basketball, the players have guaranteed contracts. But football is not like that. The vast majority of professional football players only get paid if they play. Some women told us they felt football was the most competitive of the professional sports because of the lack of guaranteed salaries. Brooke clarified,

If contracts were guaranteed the guy might be more inclined to say, you know what I’m hurt I can’t play. Whether he gets cut or not he is going to get paid. Whether he gets an injury worsened by playing he is going to get paid. Otherwise if you say, *I can’t play, I’m hurt*, they can cut you and you’re not getting paid. It’s cycle, it’s a vicious cycle.

Another source of criticism from several of the wives were the purported protective equipment. The wives saw straight through the League’s and product’s marketing efforts. Gabrielle told us her experience was that her husband and others were not as intuitive. She said she thought advances in helmet technology made the players feel invincible, and because of that invincibility, they took more risks. Felicia agreed, claiming “until they can implant shock absorbers in the brain, you will not be stopping concussions.”

Diedra, whose husband still plays, was one who knew the game was not about to undergo any significant change, despite the criticism it faces. She acknowledged the money

and the fans' support as driving forces that keep the game barbaric. She told us, "People love the violence of it. And as long as it's a violent sport, there's probably going to be concussions."

Discussion

This study was the first to explore and describe the attitudes and lived experiences of wives related to the neurological decline experienced by their husbands. Historically, football has been both praised and criticized as the "standard bearer of masculinity in sport" (Butterworth, 2014, p. 874) and a sport that glamorizes a warrior narrative (Jansen & Sabo, 1994). Playing through pain is a choice NFL players have always been willing to make:

I did what I wanted to do. I was a gladiator. That's what we do. No one could have told me not to do that ... So, if someone would have said, "If you get one more concussion, you're gonna die in ten years; you know, it's gonna speed up your death," would I have played? Yes. That's what I loved to do. So no, I wouldn't have done anything different. (Rodgers, 2014, p. 156)

Our themes support previous literature that depicts football players as repressors of pain and injury and illustrates a clear, consistent relationship between a history of playing professional football and the presence of cognitive, emotional, and/or behavioral decline. Our interviews provided vivid, emotionally charged descriptions of men (husbands) whose lives were irrevocably altered. We discovered a group of women significantly impacted in their own right by concussions and who were yearning to have their voices heard. There is no way to tell whether or not the symptoms and behaviors described by the wives were indicative of PND, but the wives overwhelmingly feared they were. Previous researchers might agree. The symptoms and behaviors described by the wives also appear in a multitude of published studies related to PND, including CTE (Armstrong et al., 2017; Geddes et al., 1999; Jordan, 2013; Liu et al., 2015; Maroon et al., 2015; McKee et al., 2009; McKee et al., 2015; Omalu et al., 2011). Thus, we found the wives' accounts and their subsequent fears to be compelling.

The consistency of the stories presented here might help to someday explain and predict behaviors associated with PND. To date, confirmation of CTE requires postmortem analysis of the brain. Recent advancements in this area are promising. For example, at UCLA, researchers have discovered a way to scan the brains of living humans and detect abnormal tau protein concentrations in the area of the brain that controls memory, emotions, and other functions (Fainaru & Fainaru-Wada, 2013). Such discovery could someday lead to early detection of CTE and could potentially lead to early treatment. While we must learn to objectify diagnoses of CTE and other forms of PND, we also we must recognize and characterize subjective signs that might lead us to believe PND is present. The reports from family members and friends who observe signs of cognitive decline, increased depression, irritability, aggression, and suicidal tendency presented here might help.

Much has been written in the literature regarding professional football players' willingness to conceal concussion, one of the themes presented by this study. An Associated Press (2011) query of 44 NFL players confirmed this and found slightly more than half ($n = 23$) of players would try to conceal the injury rather than pull themselves out of a game. Football players are often encouraged to sacrifice their body "for the sake of sporting glory" (Anderson & Kian, 2012, p. 153). The women in this study understood this and begrudgingly accepted it as something inherent with being a NFL player's wife. The wives were unprepared, however, for what came *after* their husband's playing career ended. Wives described an immense psychological burden related to being their husband's caretaker. This burden was often exacerbated by the lack of long-term health insurance provided to NFL players and by

the subsequent mounting debt, which in some cases was reported to exceed hundreds of thousands of dollars.

We were surprised how much the women wanted to tell us. As we listened to their poignant descriptions, we could not help but think that our interviews became a source of much needed *therapy*. While the men willingly adhered to an unwritten code to conceal injury, the wives also acknowledged a similar code to keep their personal lives private. But in this environment, one in which the participants' seemed to feel assured their identity would be protected, the women felt *compelled* and even *eager* to have their voices heard.

The psychological state of family caregivers should not be overlooked. It is said to be closely related to the patients' condition and often includes distress such as depression and/or anxiety (Ennis et al., 2013). Liu et al. (2015) found that the most important needs for family caregivers in these instances were reassurance, accessibility, and information. Faure and Casanova (2018) noted that 90% of NFL wives had not received access to concussion education from officials within the League. According to the women in this current study, the NFL had yet to address that topic or those surrounding PND and CTE with family members of players. Further, the League had yet to provide psychosocial services to family members of those stricken with symptoms of PND. The women were angry with the NFL for this and they claimed it provided further evidence of the League's overall lack of concern for their husbands' current state.

Four of the women who participated in this study were widows of men diagnosed with CTE. Almost all of the other women in this study were convinced their husbands already have—or will have—CTE. Their fears, however, may not be realized. Hazrati et al. (2013) warned that not all those with a prior history of repeated concussion will develop the neuropathological changes associated with PND or CTE. Similarly, not all those who play professional football will experience neurocognitive decline or develop CTE. Clearly, these NFL wives did not believe that. Social comparison theory suggests individuals tend to compare themselves to the experiences of others in similar situations (Festinger, 1954). These wives' attitudes were shaped by the publicized stories of their husbands' former colleagues stricken by PND. The mere presence of any degree of CTE's precursors, including memory loss, confusion, impaired judgment, mood swings, and progressive dementia, was viewed as both profound and petrifying.

Provvidenza et al. (2013) pointed out the importance of knowledge transfer in concussion care. They warned, "as the struggle of dealing and coping with the effects of concussion by popular sport personalities is drawn into the public eye, . . . the value of education becomes even more urgent" (p. 332). Whether or not social media sites, such as the one we relied on for this study, are helpful in serving this purpose or if they are even valuable as a social support tool remains questionable. Thus, we urge the NFL to (a) develop a systematic plan based on empirical evidence to address both concussion and PND prognoses not only with players but also their wives and families and (b) develop and provide ongoing social support services for those men stricken by the effects of PND and, perhaps even more importantly, for their wives and families.

Limitations

This study was exploratory in nature and, as such, the results are limited to descriptions that help us understand the perspectives of the women interviewed. We targeted only a small, purposive sample of wives active on a social media site dedicated to providing NFL wives with a sounding board for their concerns. Those women who chose to participate in our study were active site participants who had significant stories to tell. They also had an eagerness to have their voices heard by a larger community. We recognize these limitations along with the

potential for recall bias. We also recognize that our sample was small compared to the total number of women who have or have had husbands that played in the NFL.

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