RESEARCH ARTICLE

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Supportive vs. Unsupportive Coaching: Correlating Leadership Approaches with Injury Rates in Elite Athletes

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Abstract: This quantitative, longitudinal analysis leverages post hoc data from the National Football League (NFL) and Fox Sports to investigate the influence of coaching style on injury dynamics among elite athletes. By categorizing coaching behaviors as supportive, neutral, or unsupportive, the study examines how these styles correlate with both the frequency and type of injuries sustained by professional football players. The findings offer valuable insights for athletes, athletic trainers, medical personnel, and coaches engaged in injury prevention and rehabilitation, as well as for leadership researchers interested in performance outcomes under varying guidance styles. Guided by existing literature, three hypotheses were proposed: (a) athletes coached by unsupportive leaders will experience a higher injury incidence compared to those under supportive leadership; (b) unsupportive coaching will be associated with a greater number of chronic injuries across teams; and (c) unsupportive styles will correlate with increased injury counts and extended recovery durations among NFL athletes. Quantitative trend analysis confirms that unsupportive coaching is significantly associated with elevated incidence rates for specific injury categories. However, this correlation does not extend to all injury types. Conversely, teams led by supportive or neutral coaches exhibited significantly lower injury incidences during regular season play. Additionally, unsupportive coaching was linked to a higher prevalence of chronic injuries compared to the other styles. Overall, the study identifies robust correlations between coaching style, injury type, and occurrence, thereby underscoring the potential impact of leadership behavior on athlete health outcomes in professional football.

Keywords: Coaching Style, Injuries, American Football, Coaching Behaviour Scale

1. Introduction

Coaches exert profound influence over athletes, shaping their experiences and development through the roles they adopt and behaviors they demonstrate (Kavussanu *et al.*, 2008; Lemelin *et al.*, 2023; Shamlaye et al, 2020). Their communicative interactions, whether supportive or critical, significantly affect athletes' perceived competence, performance outcomes, motivation levels, self-confidence, and overall capabilities (Bonell *et al.*, 2021; Matosic, 2017; Misasi *et al.*, 2016; Sinclair & Vealey, 1989) Injury is an inherent risk of athletic participation, occurring during practice, competition, and beyond. Despite this, the literature has yet to explore how leadership behavior correlates with injury incidence, categorization, and recovery timelines. While numerous investigations have focused on the relational dynamics between athletes and coaches (Abraham & Collins, 2011; Baric & Bucik, 2009; Becker, 2009; Hampson & Jowett, 2014; Mageau & Vallerand, 2003; Misasi *et al.*, 2016), none have integrated leadership style with injury metrics. This study fills that gap by examining how coaching leadership styles influence the frequency, types, and recovery durations of injuries sustained by NFL athletes during a single regular season.

The nature, frequency, and timing of coach feedback are integral to the coach-athlete relationship (Misasi *et al.*, 2016; Rees, 2021). In contrast, verbal aggressiveness is a form of unsupportive communication characterized by personal criticism which undermines an athlete's psychological well-being (Bonell *et al.*, 2021; Matosic, 2017; Misasi *et al.*, 2016; Siekanska *et al.*, 2013; Sinclair & Vealey, 1989).

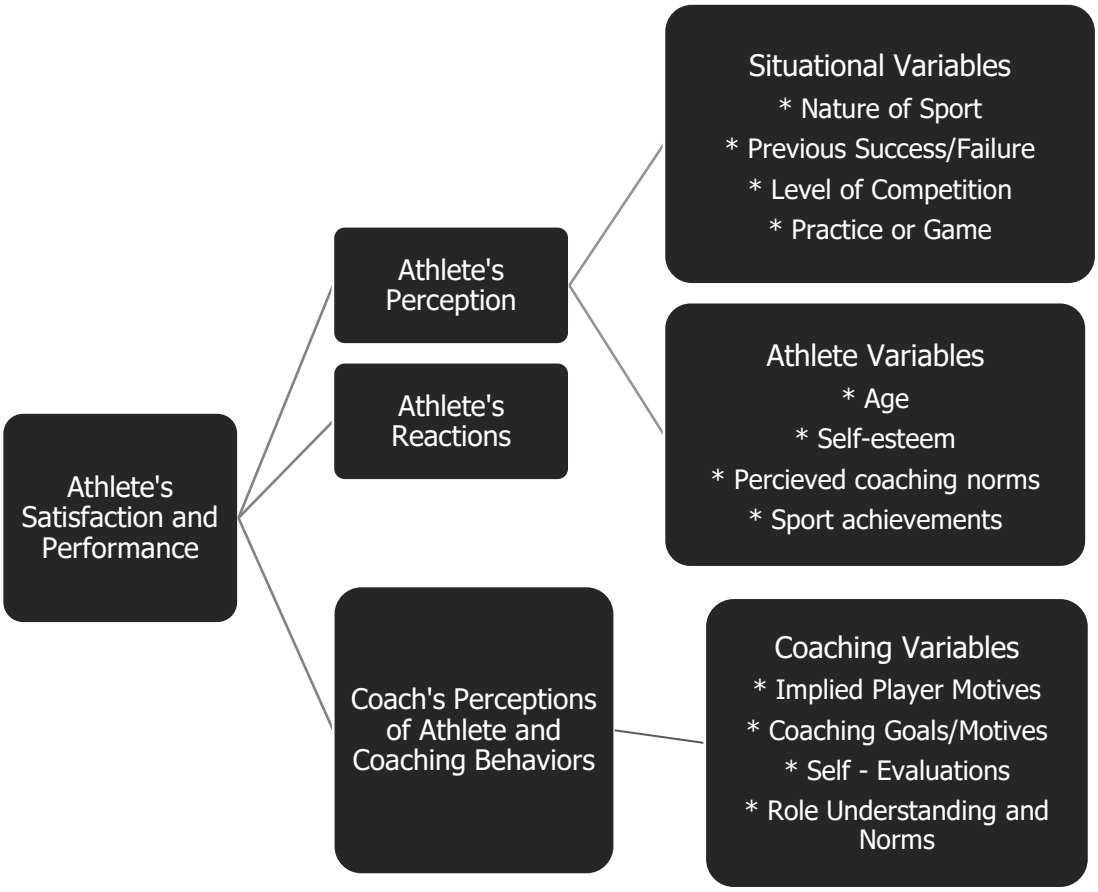

Figure 1. Leadership in Sport

Empirical evidence highlights that athletes' motivation and self-evaluations are strongly linked to the content and delivery of feedback, with more constructive and affirmative feedback enhancing the quality of the coach-athlete bond (Kavussanu *et al.,* 2008; King *et al.,* 2023; Horn, 2011; Shamlaye, 2020).

1.1 Background

The Coaching Behavior Scale for Sport (CBS-S) is a validated, multidimensional instrument devised to assess coaching behaviors that foster athlete development (Cote *et al.,*1999; Carlsson & Lundqvist, 2016; Ekstrand, 2018; Lemelin *et al.,* 2023; Sullivan *et al.,* 2014). This scale encompasses seven distinct subscales: physical training and planning, technical skill instruction, mental preparation, goal setting, competition strategies, personal rapport, and negative personal rapport. Within this framework, empirical research has identified competition strategies, personal rapport, and negative personal rapport as the most statistically robust dimensions pertinent to supportiveness assessment (Ahlberg, 2008; Bonell *et al.,* 2021; Choi *et al.*, 2013; Felton & Jowett, 2012; Hampson & Jowett, 2014; Shamlaye *et al.,* 2020). Accordingly, these three subscales serve as the primary evaluative focus for classifying supportiveness among the 49 National Football League head coaches in the current study. Organizational stress arising from poor communication, when members feel uninformed or disregarded, can elevate stress levels among staff and athletes, potentially increasing injury risk (Bonell, 2021; Ekstrand *et al.,* 2018).

Injury classification (Knight, 2008) followed a protocol based on duration of athlete absence: acute (0–4 days, rounded to one week), subacute (5–14 days, approximated as two weeks), and chronic (15+ days, operationalized as three weeks or more). If an athlete has a career/season ending injury, they are usually removed from the roster, so this could be classified as an acute injury according to this classification. Injury data, sourced from Fox Sports, lacked explicit recovery durations but did report injury sites and game-day availability. Only injuries affecting regular-season participation were included. Many coaches demonstrate a proactive stance on injury prevention, prioritizing player safety by implementing rest periods, emphasizing prevention over treatment, and seeking to identify key

risk factors such as excessive workload, insufficient recovery, and inadequate strength, but frequently relied on their own knowledge and lacked specialist support to optimally guide prevention efforts (Feeley *et al.,* 2008; Horan *et al.,* 2023; Lawrence *et al.,* 2015 &2016; Lemelin *et al.,* 2023; King, *et al.,* 2023; Rees *et al.,* 2021; Slobounov *et al.,* 2014).

Head coaches were categorized within the CBS-S schema via comprehensive publicly available information—including athlete interviews and media commentary—about their behavioral tendencies. Coaches who transitioned between teams were evaluated separately for each tenure, recognizing that a single coach might be deemed supportive under one tenure and unsupportive in another, based on athlete testimonies. Player feedback regarding coaching style was classified according to CBS-S examples. Supportive statements highlighted constructive, instructive interaction, such as a coach providing feedback and encouragement; unsupportive comments reflected abrasive, demeaning exchanges. Ambiguous or neutral observations, such as "he didn't like me," were excluded.

Supportive coaching was defined by traits such as accessibility, empathy, trustworthiness, and respect for confidentiality (Côté &Gilbert, 2009; Côté *et al.,* 1999; Lemelin *et al.,* 2023; Nicolas *et al.,* 2011). Unsupportive coaching was characterized by intimidation, favoritism, yelling, or coercive behaviors, often resulting in perceived negative personal rapport (Lemelin *et al.,* 2023; Swigonski *et al.,* 2014). Athlete statements were thus systematically categorized into supportive, unsupportive, or neutral based on the CBS-S framework. Coaches who transitioned between teams were evaluated separately for each tenure, recognizing that a single coach might be deemed supportive under one tenure and unsupportive in another, based on athlete testimonies. Player feedback regarding coaching style was classified according to CBS-S examples.

Ekstrand's research (2018), indicates that a leadership style characterized by minimal support correlates with a 23% rise in severe injuries and a 4% drop in training attendance when compared to a moderately supportive leadership style. These results align with existing studies suggesting that coaches who exhibit supportive behaviors enhance the team's collective efficacy. Such leadership is crucial not only for individual athletes but also for fostering overall team cohesion and performance. Coaches in one study perceived themselves as playing a pivotal role in injury prevention and believed they could directly influence their players' injury risk (Shamlaye, *et al.,* 2020). Many coaches hold the view that certain injuries are preventable.

2. Methods

2.1 Population and Sample

The population studied included 1,696 NFL athletes and 49 head coaches, active in practices and games during the 2013–2016 seasons, comprised the study population. Inclusion required that each athlete participated in at least one regular-season game during that span. To preserve confidentiality, no personally identifying information about players or coaches is disclosed, nor are specific injury details reported.

The Coaching Behaviour Scale for Sport (CBS-S) was employed, with targeted emphasis on the subscales of competition strategies, personal rapport, and negative personal rapport, as these domains are most indicative of supportive versus unsupportive coaching dispositions (Lemelin *et al.,* 2023; Sinclair & Vealey, 1989, Cote, 1999 & 2009). Authorization to use the instrument was obtained via email from Dr. Jean Côté. Competition strategies have seven, personal rapport has six, and negative personal rapport has eight associated with these subscales, for a total of 21 items that were examined to determine supportiveness.

A systematic online search was conducted (top 10 results per coach), examining public comments, by current or former players (within one year of playing under the coach), media personnel, and assistant coaches. Behavioral attributes described in these comments were mapped to the CBS-S subscales; each subscale assignment required at least three direct athlete quotations. Coaches were anonymized using numeric identifiers, and independent third-party sources (e.g. Carson, 2016; Harrisson, 2013-2016; Maxymuk, 2012; Rhoden, 2008, Ruiz, 2016) were consulted to minimize bias. Based on the CBS-S evaluation, coaches were categorized as neutral (n = 12), unsupportive (n = 16), or supportive (n = 21).

Fox Sports provided only injury localization and play-probability data, not recovery durations, which is why injury specifics are not detailed. Analysis was restricted to injuries recorded in regular season games. Acute injuries were measured by missing one week, equal to missing one game. Subacute injuries were grouped as two weeks equals missing two games, and chronic were established as three weeks or more, equal to missing three or more games. There are only 16 total

games (17 weeks) being included in this study, these classifications were determined before any data was collected. It is hypothesized that athletes exposed to a supportive coaching style exhibit lower injury risk, less chronic injuries, and shorter recovery times compared to those under unsupportive regimes.

Data included injury, incidence and duration, player position, and team affiliation, were compiled in Microsoft Excel, and with all identifiers removed. Illness, contagious conditions, and outside injury were excluded from the data compilation. Player position and any specific injury information was also excluded, as this could be linked back to the player. An automated script, developed in Python using the LXML library, parsed play-status and injury data from the Fox Sports NFL injury webpages (HTML), and imported the results into the study database for statistical analysis.

3. Data analysis

Data were systematically extracted from 2013–2016 regular-season NFL game injury reports using a Python script utilizing the LXML library. Seasons were selected at random, and all head coaches active during this period, regardless of mid-season transitions, dismissals, or team changes, were included in the analysis.

Coaches were categorized according to the Coaching Behaviour Scale for Sport (CBS-S) by mapping publicly documented coaching behaviors to the subscale's competition strategies, personal rapport, and negative personal rapport using third-party accounts. The CBS-S is a robust, multidimensional instrument comprising 47 items across seven constructs, validated via exploratory and confirmatory analyses, designed to assess coaching behaviors ranging from technical instruction to relational dynamics. Only 21 of these items were used across the three subscales scrutinized in this study.

For each coach, three scores were calculated to determine their level of supportiveness. Each coach was scored based on what had been written by third parties regarding each coach and how involved they were with these aspects of coaching. The competitive strategies items were the first to be calculated, one point was given to each coach for ensuring that the facilities and equipment were organized for competition because at the NFL level, the head coach is fully aware of and responsible for any facility and equipment issues (Crepeau, 2014; Jones, 2016; MacCambridge, 2005; Maxymuk, 2012). Personal–rapport items were scored at one point each when present, while negative–rapport items received 0.75 points, following a predetermined rubric. Coaches were initially assigned a neutral score unless their composite score exceeded ±0.5, in which case they were classified as supportive ($> +0.5$) or unsupportive (< -0.5). The final "supportive balance" score, computed as personal-rapport minus negative-rapport, determined categorical assignment.

Upon assigning all 49 coaches to supportive, neutral, or unsupportive groups, injury data were aggregated by coach and team. Statistical analyses, including multivariate, correlation, and mean comparisons, were conducted using IBM SPSS versions 22 and 24. When the final data was combined, in the output, the results were completely anonymized so that no athlete or coach would be revealed, and that bias would be minimal.

4. Results

Analysis began with exploratory box-and-whisker plots generated in Excel, which revealed clear trends in injury data, notably in acute and total injuries associated with coaching style. A more subtle trend was observed for chronic injuries; however, the primary signal was between coaching type and acute/total injury distributions. Figure 2 also highlights two outliers in total and chronic injury counts for the neutral coach group. Overall, the box plots illustrate that unsupportive coaching corresponds to elevated median and interquartile ranges for acute and total injuries, in comparison to both supportive and neutral coaching categories.

Subsequent analyses focused on examining the mean injury rates across various coaching styles, specifically comparing supportive and unsupportive coaching approaches. Data revealed that unsupportive coaching was associated with a higher incidence of injuries in three out of four categories—acute, chronic, and total injuries—compared to supportive coaching. In the subacute injury category, the incidence rates were nearly identical across all coaching styles. Further statistical analysis of injury means by coaching style indicated that acute injuries of supportive coaches had a mean of 38.61 injuries, slightly higher than neutral coaches at 38.32, but significantly lower than unsupportive coaches at 48.23. Subacute injuries exhibit that supportive coaches reported 13.1 injuries, neutral coaches 13.5, and unsupportive coaches 14.9, with negligible differences among the groups.

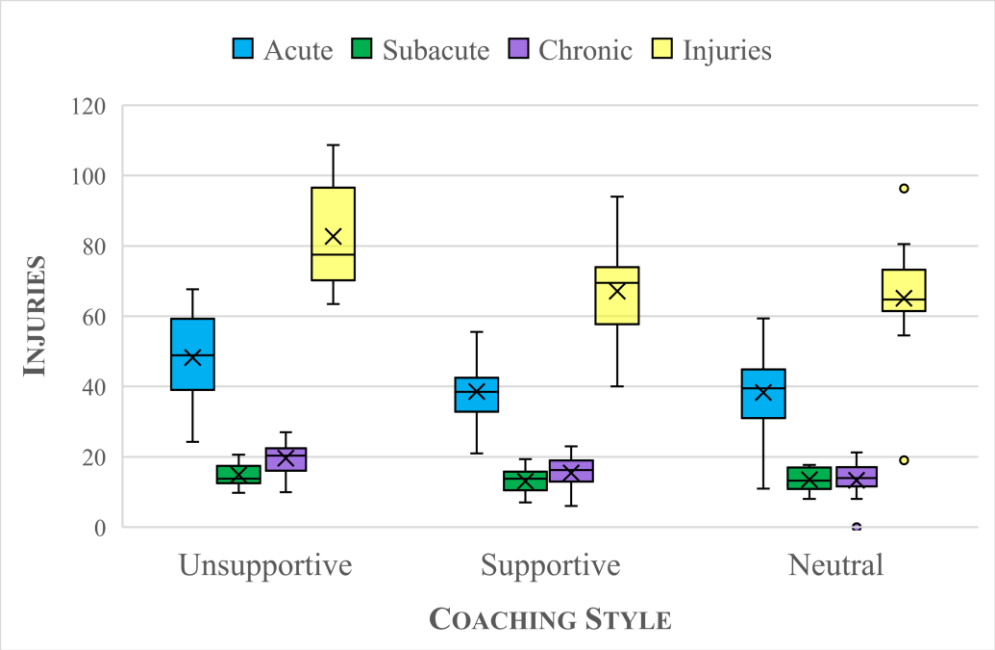

Figure 2. Coaching styles and injury types.

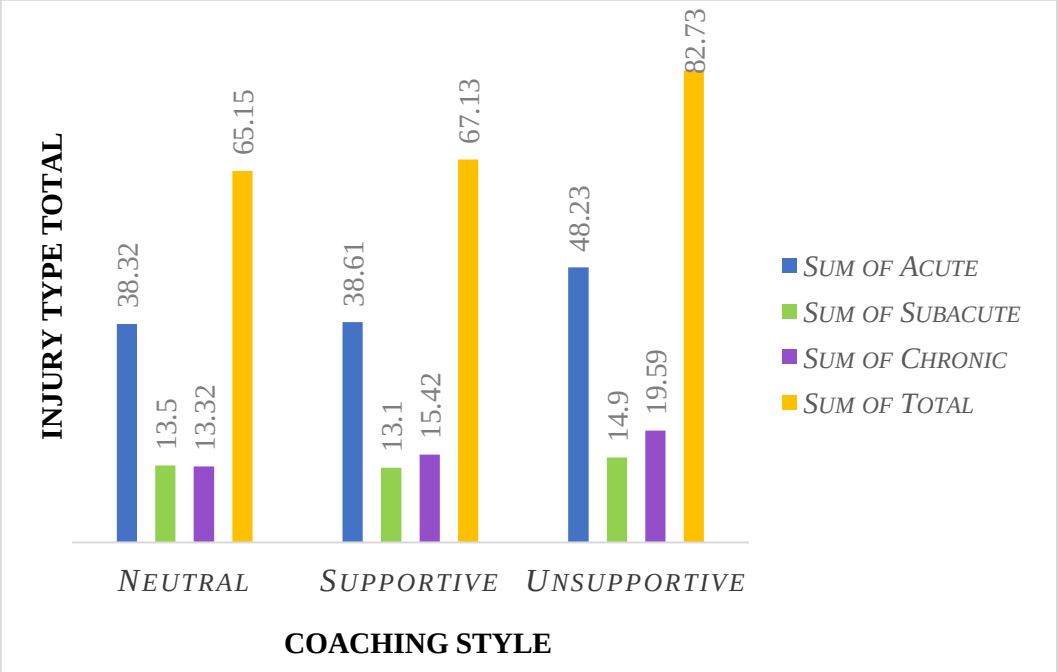

Figure 3. Total means for injury type and coaching style.

Chronic injuries reveal supportive coaches had 15.42 injuries, neutral coaches 13.32, and unsupportive coaches 19.59, indicating a higher prevalence under unsupportive coaching. This indicated that total injuries of supportive coaches experienced 67.13 injuries, neutral coaches 65.15, and unsupportive coaches 82.73, with unsupportive coaching correlating with the highest total injury count. These are shown in Figure 3 and Table 1. These findings emphasize the significant impact of coaching style on injury rates among NFL players, highlighting the potential benefits of supportive coaching practices in reducing injury incidence.

Pearson's r correlations were performed to determine if this difference was significant as seen in Table 2. For acute injuries, the comparisons with subacute (r = 0.6), chronic (r = 0.5), and total (r = 0.9) injuries yielded large effect sizes. Similarly, in the subacute injury category, comparisons with acute (r = 0.6), chronic (r = 0.6), and total (r = 0.8) injuries also demonstrated large effect sizes. For chronic injuries, comparisons with acute (r = 0.5), subacute (r = 0.6),

and total (r = 0.8) injuries indicated large effect sizes. Lastly, in the total injury category, comparisons with acute (r = 0.9), subacute (r = 0.8), and chronic (r = 0.7) injuries revealed large effect sizes.There was statistical significance observed across all injury types (p = 0.00) at a one-tailed α = 0.01 level. Due to each team having one head coach, and a player roster capped at 53 players, a subsequent between-subjects MANOVA was performed presented in Table 3, which indicated significant differences in acute (p = 0.015), chronic (p = 0.003), and total (p = 0.006) injuries associated with coaching style. However, subacute injuries did not show a statistically significant correlation (p = 0.29).

Table 1. Coaching Style vs. Injury Type Means

Dependent Variable	Coaching Style	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	UpperBound
Acute	Neutral	38.326	3.048	32.191	44.462
	Supportive	38.615	2.304	33.977	43.253
	Unsupportive	48.234	2.640	42.921	53.548
Subacute	Neutral	13.500	1.007	11.474	15.526
	Supportive	13.095	.761	11.563	14.627
	Unsupportive	14.901	.872	13.146	16.656
Chronic	Neutral	13.326	1.348	10.613	16.040
	Supportive	15.421	1.019	13.370	17.472
	Unsupportive	19.594	1.167	17.244	21.944
Total	Neutral	65.153	4.565	55.963	74.342
	Supportive	67.131	3.451	60.184	74.077
	Unsupportive	82.729	3.954	74.771	90.687

Table 2. Pearson Correlations for Injury Type and Coaching Style

		Acute	Subacute	Chronic	Total
Acute	Pearson Correlation	1	.600**	.524**	.932**
	Sig. (1-tailed)		.000	.000	.000
	Sum of Squares and Cross-products	6148.5	1143.4	1480.6	8772.6
	Covariance	128.095	23.822	30.847	182.764
	N	49	49	49	49
Subacute	Pearson Correlation	.600**	1	.638**	.786**
	Sig. (1-tailed)	.000		.000	.000
	Sum of Squares and Cross-products	1143.4	590.2	558.7	2292.5
	Covariance	23.822	12.298	11.641	47.760
	N	49	49	49	49
Chronic	Pearson Correlation	.524**	.638**	1	.772**
	Sig. (1-tailed)	.000	.000		.000
	Sum of Squares and Cross-products	1480.634	558.765	1298.924	3338.323
	Covariance	30.847	11.641	27.061	69.548
	N	49	49	49	49
Total	Pearson Correlation	.932**	.786**	.772**	1
	Sig. (1-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products	8772.655	2292.503	3338.323	14403.481
	Covariance	182.764	47.760	69.548	300.073
	N	49	49	49	49

** Correlation is significant at the 0.01 level (1-tailed)

Table 3. MANOVA Results for Coaching Style and Injury Type

			F	Sig.
Acute × Coaching style	Between Groups	(Combined)	4.572	.015
	Within Groups			
	Total			
Subacute × Coaching style	Between Groups	(Combined)	1.270	.290
	Within Groups			
	Total			
Chronic × Coaching style	Between Groups	(Combined)	6.785	.003
	Within Groups			
	Total			
Total × Coaching style	Between Groups	(Combined)	5.796	.006
	Within Groups			
	Total			

Other analyses of significance and correlations were performed in Table 4 to verify these findings. Tukey HSD found significance in the acute injuries associated with supportive compared with unsupportive coaches (p = 0.30); chronic injuries and neutral coaches compared with unsupportive coaches (p = 0.005); supportive compared with unsupportive (0.036); total injuries and neutral coaches compared with unsupportive (p = 0.026); and supportive compared with unsupportive (p = 0.023). The Dunnett t (two-sided)[b] analyses compared the supportive and unsupportive coaching styles with the neutral style. These analyses found significance in the relationship between unsupportive coaching and acute (p = 0.039), chronic (p = 0.004), and total (p = 0.018) injuries. These multiple comparisons also included using the neutral coaches as a control to show substantial differences in means for acute injuries with unsupportive versus supportive coaches (Tukey HSD; M = -9.61), unsupportive versus supportive (M = 9.61) and Dunnett t (two-sided)[b] (M = 9.90). This also was observed for chronic injuries with unsupportive versus neutral coaching (M = -6.26, 6.26) and unsupportive versus supportive coaching (M = -4.17, 4.17) and Dunnett t (two-sided)[b] (M = 6.26) as well as for total injuries with unsupportive versus neutral coaching (M = -17.57, 17.57) and unsupportive versus supportive coaching (M = -15.59, 15.59) and Dunnett t (two-sided)[b] (M = 17.57).

Table 5 illustrates a sums-of-squares and cross-products (SSCP) analysis was conducted to partition variability across distinct injury phases and coaching styles. Specifically, the Intercept SSCP quantified baseline variability absent any "Coach Style" effect, yielding values of 80,996.63 for acute injuries, 8,901.11 for subacute, and 12,079.62 for chronic cases. The Coach Style SSCP captured the between-group variability attributable to coaching intervention, with SSCPs of 1,019.59 for acute, 30.90 for subacute, and 295.89 for chronic phases. Residual variability, assessed by the Error SSCP, accounted for unexplained differences after adjusting for coach style, measured at 5,128.99 (acute), 559.40 (subacute), and 1,003.04 (chronic). When combined, the total SSCP—which encompasses both model (hypothesis) and error components—was 139,126.85 for acute cases and 53,728.42 for chronic cases.

The Coach Style SSCP indicates the strongest association in acute injuries (1,019.59), suggesting that coaching methodology significantly influences outcomes in this phase, while chronic injuries also display substantial coach-related variation (295.89), and subacute injuries exhibit minimal coach influence (30.90), implying that other factors predominate in the subacute stage. Examination of the Error SSCP reveals that residual variance is highest in acute cases (5,128.99), indicating lower model predictability, moderate for chronic injuries (1,003.04), and lowest for subacute injuries (559.40), suggesting relatively better model fit for subacute conditions. Despite these coaching effects, the intercept SSCP overwhelmingly dominates total variation (e.g., acute baseline: 80,996.63 vs. coaching effect: 1,019.59), underscoring that baseline injury variability far exceeds the influence of coach style—especially in subacute scenarios, where coaching accounts for only a minor proportion of total variance. Coaching resources should be prioritized toward acute injury management, where the association

with coach style is strongest, while also incorporating targeted interventions for chronic injuries, given their moderate coach-related impact. Subacute injuries demonstrated negligible influence from coaching style, emphasizing the need to identify and explore alternative predictors beyond coaching interventions. Table 6 includes all 49 coaches that were included in this study. They were assigned randomized numbers and this table displays the data collected from the comments made by current and former players about the specific coach. This table represents the specific CBS-S wording for the categories included in the study.

Table 4. Multiple Comparisons of Coaching Style Using Neutral as the Control

Dependent Variable		(I) Coaching style	(J) Coaching style	Mean Difference (I-J)	Std. Error	Sig.
Acute	Tukey HSD	Neutral	Supportive	-.288	3.86	.997
			Unsupportive	-9.90	4.08	.056
		Supportive	Neutral	.288	3.86	.997
			Unsupportive	-9.61*	3.54	.030
		Unsupportive	Neutral	9.907	4.081	.056
			Supportive	9.61*	3.54	.030
	Dunnett t (2-sided)[b]	Supportive	Neutral	.288	3.86	.996
		Unsupportive	Neutral	9.90*	4.08	.039
Subacute	Tukey HSD	Neutral	Supportive	.404	1.31	.949
			Unsupportive	-1.40	1.38	.576
		Supportive	Neutral	-.404	1.31	.949
			Unsupportive	-1.80	1.20	.307
		Unsupportive	Neutral	1.40	1.38	.576
			Supportive	1.80	1.20	.307
	Dunnett t (2-sided)[b]	Supportive	Neutral	-.404	1.31	.928
		Unsupportive	Neutral	1.40	1.38	.488
Chronic	Tukey HSD	Neutral	Supportive	-2.09	1.72	.457
			Unsupportive	-6.26*	1.82	.005
		Supportive	Neutral	2.09	1.72	.457
			Unsupportive	-4.17*	1.58	.036
		Unsupportive	Neutral	6.26*	1.82	.005
			Supportive	4.17*	1.58	.036
	Dunnett t (2-sided)[b]	Supportive	Neutral	2.09	1.72	.371
		Unsupportive	Neutral	6.26*	1.82	.004
Total	Tukey HSD	Neutral	Supportive	-1.97	6.00	.942
			Unsupportive	-17.57*	6.34	.026
		Supportive	Neutral	1.97	6.00	.942
			Unsupportive	-15.59*	5.51	.023
		Unsupportive	Neutral	17.57*	6.34	.026
			Supportive	15.59*	5.51	.023
	Dunnett t (2-sided)[b]	Supportive	Neutral	1.97	6.00	.919
		Unsupportive	Neutral	17.57*	6.34	.018

Based on observed means

The error term is mean square (error) = 275.767.

*. The mean difference is significant at the .05 level.

b. Dunnett t-tests treat one group as a control and compare all other groups against it.

Table 5. Between Subjects SSCP Matrix Injury Type with Coach Style

			Acute	Subacute	Chronic	Total
Hypothesis	Intercept	Acute	80996.634	26850.700	31279.517	139126.851
		Subacute	26850.700	8901.112	10369.282	46121.093
		Chronic	31279.517	10369.282	12079.616	53728.415
		Total	139126.851	46121.093	53728.415	238976.360
	Coach type	Acute	1019.585	172.904	521.690	1714.179
		Subacute	172.904	30.895	81.721	285.520
		Chronic	521.690	81.721	295.885	899.297
		Total	1714.179	285.520	899.297	2898.996
Error		Acute	5128.988	970.544	958.944	7058.476
		Subacute	970.544	559.396	477.043	2006.983
		Chronic	958.944	477.043	1003.039	2439.026
		Total	7058.476	2006.983	2439.026	11504.485

Based on type III sum of squares

Coach Number	helps return to focus on performing well	prepares team to face a variety of situations	keeps players focussed in competitions	has a consistent routine at competitions	deals with problems players may have at competitions	shows confidence in players ability during competition	ensures facilities and equipment are organized for competition	shows understanding for players as people	is a good listener	is easily approachable about personal problems	demonstrates concern for whole person	is trustworthy with personal problems	maintains confidentiality regarding personal life	uses fear in coaching methods	yells at players when angry	disregards players opinions	shows favoritism towards others	intimidates players physically	uses power to manipulate players	makes upsetting personal comments	spends more time coaching the best athletes
1					X		X							X		X					X
2			X				X							X	X	X	X	X	X		X
3		X	X	X		X	X							X	X	X	X		X	X	X
4	X	X				X	X			X	X	X									
5			X				X							X		X			X	X	
6	X	X	X	X	X	X	X	X	X	X			X								
7	X	X	X	X		X	X	X	X	X	X		X								
8	X	X		X		X	X	X	X		X	X									
9		X	X	X			X							X		X	X		X		X
10	X	X	X	X		X	X	X			X				X		X				
11	X	X	X	X	X	X	X	X		X	X	X									
12	X	X			X	X	X				X	X			X						
13	X	X		X	X		X	X		X		X									
14		X	X	X	X	X	X	X				X	X		X				X	X	X
15	X	X	X	X		X	X	X		X	X		X								
16		X		X			X							X	X				X	X	
17	X	X	X	X	X	X	X			X				X	X		X		X		X
18	X	X	X	X		X	X							X	X		X		X		X
19	X	X	X	X		X	X	X		X	X	X									
20	X		X	X			X			X		X									
21	X	X	X	X		X	X	X		X		X	X								
22	X	X	X	X			X	X		X		X									
23	X	X	X	X			X									X					X
24	X	X	X	X			X							X	X	X				X	X
25	X	X	X	X			X	X	X			X									
26	X	X	X	X		X	X	X		X	X			X		X					X
27	X	X	X	X			X								X	X					X
28	X	X	X	X			X					X	X			X					X
29	X	X	X	X			X	X				X				X					X
30	X	X	X	X			X			X		X		X		X					X
31		X	X	X			X			X		X				X					X
32	X	X	X	X			X	X							X	X		X			X
33	X	X	X	X			X	X		X		X									
34	X	X	X	X			X	X		X		X									X
35	X	X	X	X			X	X			X			X		X					X
36	X	X	X	X	X		X	X			X										
37	X	X	X	X		X	X	X		X		X	X								X
38	X	X	X	X	X	X	X	X		X	X	X	X								X
39	X	X	X	X			X							X	X	X	X	X	X	X	X
40	X	X	X	X	X	X	X	X				X			X						X
41	X	X	X	X	X	X	X	X			X	X	X		X						X
42	X	X	X	X		X	X			X	X					X	X				X
43	X	X	X	X	X	X	X	X		X	X	X									
44	X	X	X	X		X	X	X		X				X	X						
45	X	X	X	X	X	X	X	X		X		X			X						
46	X	X	X	X		X	X	X			X		X		X						
47	X	X	X	X			X			X					X						X
48	X	X	X	X			X				X				X						X
49	X	X	X	X			X	X			X						X				X

Table 6. CBS-S Categories Data with Coach Number

5. Discussion

Data from four NFL seasons (2013–2016) were analyzed, with the injury counts normalized by years coached to ensure comparability across coaches. The results indicate significant correlations between coaching style and injury incidence: unsupportive coaching is associated with significantly higher rates of total, acute, and chronic injuries, while subacute injuries did not exhibit a significant relationship. In contrast, supportive coaching correlates with lower incidence of total, acute, and chronic injuries. These findings confirm the significant impact of coaching style on injury rates among NFL players, highlighting the potential benefits of supportive coaching practices in reducing injury incidence.

Specifically, teams led by unsupportive coaches showed a mean of 14.9 subacute injuries, exceeding the overall mean of 13.8, and a total injury mean of 82.7, compared to the overall mean of 71.7. Since subacute and chronic injuries require longer recovery times, this supports the hypothesis that coaching style influences not only injury frequency but also recovery duration.

Risk-taking behavior can increase as athletes gain more experience in their sport and become accustomed to playing through injuries, including concussions. Bonell (2021), Horan (2023), King (2023), and Rees (2021) found that coaches can reinforce this mindset by normalizing pain and encouraging players to continue despite injury, which may downplay athletes' perceptions of concussion risk and discourage reporting. Research has shown that when college football players believe their coaches support their decision to report a suspected concussion, they are significantly less likely to keep playing while exhibiting symptoms (Baugh *et al.,* 2019). Lemelin (2023), discovered that coaches who underwent the "*re*Root" program did not exhibit a significantly more favorable perception of autonomy-supportive coaching behaviors at the two-month follow-up compared to non-participants; however, by the one-year mark, the program group demonstrated a meaningful increase in their endorsement of these supportive coaching practices. The "reRoot" coaching sessions centers on developing autonomy-supportive communication strategies to enhance athlete engagement and motivation. Coaches are guided to avoid controlling language and behaviors, instead fostering a supportive environment by validating athletes' emotions and perspectives. This supports the results found in this study, when an unsupportive coach downplays an injury or lacks support, an injury may take longer to heal due to the lack of motivation an athlete may have to return to play under this style of coach.

Bonell (2021), Bolling (2020), King (2023), and Rees (2021) agree that injury perception is strongly linked to its impact on athletic performance, particularly at the elite level where achieving peak performance is paramount. This drive often generates intense internal pressure, rooted in fears of being dropped or judged, as well as external pressure, whether real or imagined. Both forms of pressure can lead athletes to push through pain, increasing the likelihood of injury. This correlates with what was found in this study, because unsupportive coaches use fear and judgement, whereas supportive coaches are encouraging and respectful.

This study did not adopt an economic model, as each NFL team's medical staff operates independently of the head coach's style (Brophy *et al.,* 2009; Desai *et al.,* 2023; Slobounov, 2014; Smart *et al.,* 2016). Instead, this study initiates a conversation regarding the relationship between coaching behaviors and athletes' injury rates and recovery processes. A future prospective study is essential to validate these findings, as our current retrospective design allows us to identify associations, but do not conclusively demonstrate causality. Despite unsupportive coaching, some head coaches continue to achieve high performance, one such coach, considered among the least supportive, still produced significant wins, demonstrating that success in competition may not correlate with athlete well-being. Only head coaches were considered, given their overarching influence on team culture and staff.

A primary limitation of the study is the absence of direct athlete feedback via survey. It remains unclear whether athlete-classified coaching styles, if anonymous and candid, would produce similar coach categories or alter the results. To reduce bias, the researcher relied exclusively on third-party sources (books, articles, periodicals, and online commentary), requiring at least three direct player quotations per coach to validate classification. Some descriptors encountered ranging from "caring" and "good listener" to "abrasive," "controlling," or even humorous labels like "Sith Lord" did not align with CBS-S categories and were therefore excluded, underscoring both the strengths and limitations of using publicly available commentary for behavior assessment. Another limitation would be that if an athlete had a season ending injury, depending upon when the team removed the athlete from the active roster their injury could be classified in the acute or subacute classification and not the chronic classification where it should be classified. If a coach

was only the head coach for one season or moved from one team to another there is no way to determine if they changed in supportiveness, which is a limitation. The classification of missing two or three games might not be enough time to rank subacute and chronic injuries appropriately. A final limitation to consider is not being able to determine if an injury was definitively acute, subacute or chronic in certain cases (e.g. An athlete has an ankle injury for one week, then the following week sustains a knee injury) due to the injury type and location being removed for identification purposes.

6. Conclusion

This study's significance lies in its clear demonstration of strong correlations between coaching style and both injury frequency and recovery duration in NFL athletes. Specifically, unsupportive coaching is significantly associated with higher rates of total, acute, and chronic injuries, while subacute injuries did not show a notable relationship. Conversely, teams under supportive coaching exhibited lower incidences of total, acute, and chronic injuries, underscoring a direct linkage between leadership style and injury outcomes.

Importantly, teams led by unsupportive coaches averaged 14.9 subacute injuries—above the overall mean of 13.8—and a total injury average of 82.7, compared to the league mean of 71.7. The elevated counts of subacute and chronic injuries, which require longer rehabilitation, reinforce the conclusion that unsupportive leadership potentially exacerbates both injury risk and recovery duration.

Although economic variables were not assessed, given that each NFL team maintains its own medical staff independent of coaching style, the focus remained on quantifying injury frequency and severity as a function of head coach behavior. Interestingly, success under unsupportive coaching is not precluded, as historical win records confirm, demonstrating that performance achievements do not always safeguard athlete well-being.

The research focused solely on head coaches due to their pivotal role in shaping team culture and cascading influence on coaching staff.

A primary limitation is the absence of direct athlete survey data, which could offer more nuanced insights, however this study does initiate a conversation that should be researched further. Future studies should incorporate anonymous evaluations from current athletes, assistant coaches, and medical personnel. Subsequent studies should incorporate injury type and location, to see if this information is necessary. The classification of subacute and chronic injuries should be more appropriately spaced out, e.g. subacute 3 -6 games missed and chronic 7 or more missed games. A prospective study should confirm these results, because this study design cannot allow us to conclude causality of injury or recovery time. Moreover, this research framework could be adapted to other sports, organizational environments, and educational contexts, where leadership style and interpersonal communication critically affect well-being and performance. Broader context and implications in the literature suggest that authoritarian or controlling coaching styles correlate with elevated injury risk and adverse athlete well-being. This study initiates a vital conversation on how leadership approaches influence not only athletic performance but also athlete safety, recovery, and long-term welfare.

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Ethics Approval Statement

This study has been approved Institutional Review Board. Following the expedited review procedures as outlined by part §46.110 of the regulatory guidelines of Health and Human Services Codes of Federal Regulations pertaining to the protection of human subjects (Title 45, Part 46).

Permission to use the CBS-S was granted from the inventor of the scale, Dr. Jean Cote, as long as the scale is not reproduced or published.

Does this article pass screening for similarity?

Yes

Informed Consent

The consent form was signed before the commencement of the study.

Conflict of Interest

The authors declare that there was no conflict of interest.