

# Factors That May Influence Americans' Views on When Children Should Start Playing Tackle Football

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**Context:** American football is associated with the largest number of emergency department visits for pediatric sport-related traumatic brain injury, including concussions. Tackling is responsible for almost two-thirds of football concussions. Some have recommended implementing age restrictions on tackling in youth football.

**Objective:** To determine whether the public would support age restrictions and the factors that may drive such support.

**Design:** Cross-sectional study.

**Setting:** Summer wave of Porter Novelli's 2020 US Consumer Styles survey.

**Participants:** A total of 4053 adults.

**Main Outcome Measure(s):** Respondents answered questions about a good age for children to start playing tackle football, past football playing history, concerns about safety, and the benefits and risks of playing football.

**Results:** Most respondents believed that middle (32.8%) or high (27.8%) school was a good age to start playing tackle football. About 1 in 5 (19.8%) respondents reported that children should

never play tackle football. Certain groups of individuals were more likely to support children starting to play tackle football at high school age or above or to say that they should never play tackle football, including those with a bachelor's degree or higher (rate ratio [RR]<sub>HS+</sub> = 1.41, 95% CI = 1.14, 1.76; RR<sub>NEVER</sub> = 2.70, 95% CI = 1.93, 3.78), those who did not have children under 18 (RR<sub>HS+</sub> = 1.54, 95% CI = 1.26, 1.90; RR<sub>NEVER</sub> = 1.54, 95% CI = 1.14, 2.07), those who were not football fans (RR<sub>NEVER</sub> = 3.07, 95% CI = 2.32, 4.06), and those who were very (RR<sub>HS+</sub> = 3.94, 95% CI = 2.87, 5.42; RR<sub>NEVER</sub> = 11.52, 95% CI = 7.32, 18.15) or somewhat (RR<sub>HS+</sub> = 1.88, 95% CI = 1.41, 2.52) concerned about the safety of children.

**Conclusion:** Despite acknowledging the benefits of playing football, many adults expressed concern about safety and endorsed high school age and older or never as a good age to start playing tackle football, highlighting a disconnect with current football program practices regarding age.

**Key Words:** concussion, traumatic brain injury

## Key Points

- Many adults expressed concerns about safety and endorsed older age or never as a good age for kids to start playing tackle football.
- These results highlight a disconnect with football program practices regarding age, as many allow children 5 years of age and older to participate in tackle football.
- This study suggests a large portion of the public may be ready to support policy changes regarding age-based restrictions.

More than 2 million children play American football, also known as *tackle football*, in the United States annually. This includes approximately 1.5 million adolescents aged 13 to 17 years<sup>1</sup> and more than 800 000 children aged 6 to 12 years.<sup>2</sup> Tackle football and other sports promote the development of leadership skills and teamwork and may increase mental, emotional, social, and physical health among children.<sup>3</sup> Still, participation in tackle football carries the risk for serious injury. The most common injuries sustained by youth tackle football athletes are fractures and dislocations, sprains and strains, and contusions. Although less frequent than some other injuries in youth football, Americans are substantially concerned about the risks for concussions and other traumatic brain injuries (TBIs) in tackle football due to the potential for serious and long-term effects.<sup>4-6</sup>

Symptoms of concussion and other TBIs may not only affect a child's physical, cognitive, and mental health but also learning, self-regulation, and social participation, all of which are important to becoming a productive adult.<sup>7</sup> Most

youth with a concussion or other TBI will experience  $\geq 1$  symptoms that affect their ability to participate in school and other activities during the acute period.<sup>8</sup> However, recovery from a concussion or other TBI may be prolonged for some children, lasting weeks, months, or longer.<sup>7</sup>

Due to the likelihood of collisions and contact between athletes, tackle football is associated with the highest number of sport- and recreational TBI-related emergency department visits among boys aged 17 and under.<sup>9,10</sup> Contact restrictions and modifying tackling techniques have demonstrated some promise in reducing head impacts and concussions during youth tackle football practices.<sup>11-15</sup> Unfortunately, current interventions have displayed little to no success in reducing head impacts and concussions during youth tackle football competitions or games.<sup>11-15</sup> Thus, to address concussion and injury risk on a broad scale, some groups have proposed implementing age-based restrictions for youth tackle football athletes.<sup>16,17</sup> For example, policymakers in California, New Jersey, and New York have proposed legislation that, if passed,

would restrict tackle football participation in their state to youth older than 12 years of age.<sup>18</sup>

Age restrictions are common in sports and are designed to promote athlete safety and reduce the risk of injuries. Most soccer and ice hockey programs have age-based restrictions on activities that increase the risk for concussion (eg, heading and body checking). Moreover, some youth football programs use age (and at times, a combination of age and weight) to assign participation in divisions and teams to decrease the risk of injury (including head injuries). However, tackling restrictions in youth football vary by program and are not generally age specific. Widespread use of age-based restrictions in youth tackle football programs would necessitate a shift in how the sport is played and likely require the support of fans and consumers—the most influential stakeholder groups in professional sports programs. Professional tackle football is the most watched sport<sup>19</sup> and has the most dedicated fan base<sup>20</sup> in the United States. Interventions that change the context for individual behavior (eg, policies) tend to be more effective public health actions.<sup>21</sup> Yet successfully implementing these types of interventions is contingent on stakeholder “buy-in” or support.<sup>21</sup> Prior researchers noted that sports programs (including professional sports leagues) have made institutional changes or shifted their response due to pressure and concerns from key stakeholders (eg, government, scientific community, fans, and consumers) regarding concussion and athlete safety.<sup>22,23</sup> For example, Heinze and Lu found that, in response to pressure to change and to take control of the narrative on concussion and athlete safety, the National Football League and other sports programs built coalitions to support passage of laws focused on young athletes regarding concussion in sports.<sup>23</sup> Building on these studies, we examined Americans’ views on the age at which children should start playing tackle football and what might influence their opinions and decision-making processes. Further, we explored readiness for changes in policies regarding age-based restrictions in youth tackle football. We hypothesized that certain groups of individuals, such as women, parents with children <18 years of age, those with more education, and those who reported little or no personal or emotional connection to tackle football (eg, not a fan of tackle football, did not play tackle football) as well as those who were concerned about tackle football safety, would be more likely to endorse either an older age group for children to start playing or never playing the sport.

## METHODS

### Study Population

This was a cross-sectional study that used self-reported data collected from the summer wave (“SummerStyles”) of Porter Novelli’s 2020 ConsumerStyles survey (<http://styles.porternovelli.com>). SummerStyles is an annual web-based survey of US adults aged 18 years or older that was administered during June 2020. As part of the survey, participants were asked questions on a variety of topics, including their internet use, health promotion behaviors, and experiences or activities related to the 2019 pandemic. Participants also answered questions regarding their perceptions of tackle football, their views on the age at which children should start playing tackle football, and the factors that might influence their opinions. No questions in the survey pertained to their perceptions of other sports. For answering the survey questions, participants received 10 000 cash-equivalent reward points that

were redeemable online for gift cards and prizes. All participants were drawn from the Ipsos KnowledgePanel that gathers insights about US consumers. Participants were initially recruited using probability-based sampling of addresses. The survey was sent to 6463 participants. A total of 4053 completed the instrument (62.7%). Of those, 4049 (62.6%) answered the football-related questions. Data for this study were weighted to be nationally representative using Current Population Survey distributions based on sex, age, race and ethnicity, education, household income, household size, census region, and metropolitan status (Supplemental Table 1, available online at <https://dx.doi.org/10.4085/1062-6050-0004.23.S1>). This investigation was exempt from institutional review board review as personal identifiers were not included. Access to the SummerStyles data was granted through a data-use agreement with Porter Novelli Public Services.

### Measures

Participants were first asked demographic questions (sex, age, education, race or ethnicity, US region, urban or rural status, income, and presence of children under age 18) to permit an understanding of their diversity. Next, they were asked questions about football. These questions included asking about a good age for children to play tackle football, if they agreed or disagreed that they were fans of American football, past tackle football participation history, concerns about safety, the benefits of and reasons why children should or should not play tackle football, reasons that children may sustain concussions or other brain injuries while playing tackle football, and where they received information on football safety. The verbatim wording of the football-related questions is provided in Table 2. The outcome measure was based on responses to the question, “When is a good age for kids to start playing tackle football?” The answer choices were *elementary school age* (5 to 10 years old), *middle school age* (11 to 13 years old), *high school age* (14 to 17 years old), *college age and above* (18 years or older), or *never*. For the bivariate analysis and modeling, we combined the answer choices to create a variable with 3 levels: *elementary/middle school*, *high school/college*, and *never*. This allowed us to describe the characteristics of people more likely to indicate that youth should never play tackle football or should not start tackle football until age 14 or older. The questions, “Do you or did you play tackle football on an organized team (outside PE [physical education]/gym class)?” and, if yes, “How many years did you play tackle football on an organized team (outside PE/gym class)?” assessed past tackle football participation. Responses to these questions were combined to create a variable with 3 levels: *0 years*, *1 to 4 years*, and *greater than or equal to 5 years*. Finally, the answer choices to the question, “I am a fan of American football,” were dichotomized to *agree* and *disagree* for the modeling.

### Statistical Analysis

We calculated frequency distributions for each question and  $\chi^2$  tests to determine which factors (demographic characteristics and the specific questions about tackle football) were associated with the outcome (“When is a good age for kids to start playing tackle football?”; Supplemental Table 2). The significance level was set at  $\alpha = .05$ . Effect sizes were also computed for each  $\chi^2$  test using the Cramer V. Findings

were interpreted in accordance with Cohen<sup>24</sup> to determine the bivariate associations' practical significance. An *r* value of 0.1 represented a *small* effect size; 0.3, a *medium* effect size; and 0.5, a *large* effect size.<sup>24</sup> We computed a multinomial logistic regression model with the younger age grouping (elementary/middle school age) as the reference group to assess the relationship between the factors and the outcome. The regression model was adjusted for factors that were significant in the  $\chi^2$  tests. The reference groups for the factors were chosen as the level with the largest percentage that supported the elementary/middle school level of the outcome variable. Associations are presented as adjusted risk ratios (RRs) and 95% CIs. In addition, multicollinearity was evaluated in the regression model, and factors were removed when multicollinearity was present. A subanalysis was also conducted whereby the data set focused on the same outcome variable and predictors but was restricted to parents who had children <18 years of age. Analyses were performed using SAS (version 9.4; SAS Institute Inc) and Stata (version 15; StataCorp LLC), taking the complex survey design into account.

## RESULTS

Demographic characteristics after weighting was applied are presented in Table 1. The percentages of men (48.4%) and women (51.6%) were similar. The age distribution showed that 20.4% were between the ages of 18 and 29 years, 25.1% were between ages 30 and 44 years, 25.3% were between 45 and 59 years, and 29.1% were 60 years of age or older. Most individuals had some college or postcollege education (61.2%). Approximately two-thirds (63.4%) were non-Hispanic White, 87.9% lived in an urban area, and most did not have any children under the age of 18 years (72.8%).

Regarding the respondents' reported personal or emotional connection to tackle football, the results from the survey questions regarding past playing experience and whether they were fans of tackle football are provided in Table 2. More than half strongly or somewhat agreed that they were fans of American football (56.9%), and only 15.1% either played tackle football in the past or were currently playing football on an organized team. Of these 15.1%, 13.7% were men, and 1.4% were women (data not shown). Over one-quarter (28.5%) of individuals who described playing organized football in the past or currently playing had played for  $\geq 5$  years.

Respondents' views on a good age to start playing tackle football; perceptions of the sport's safety, risks, and benefits of playing; and information sources for football safety are displayed in Table 2. The most frequent answers to the question of a good age for children to start playing tackle football were middle school (11 to 13 years of age) and high school (14 to 18 years of age) at 32.8% and 27.8%, respectively. Approximately one-fifth of individuals (19.8%) reported that there was no good age at which to play tackle football. Most individuals (86.5%) were somewhat or very concerned about the safety of children playing tackle football. The most frequently endorsed benefits of children playing football were keeping physically active (65.1%) and teaching good skills for life (55.4%). The most often cited reason as to why children should not play tackle football was the possibility of sustaining concussions or other brain injuries (83.3%) or other kinds of injuries (66.1%). When specifically asked for reasons why children may incur concussions or other brain injuries while playing tackle football, the most frequent reasons were "the

**Table 1. Characteristics of Respondents in the 2020 SummerStyles Survey<sup>a</sup>**

Characteristic	No.	Weighted Percentage <sup>d</sup>
<b>Sex</b>		
Men	2041	48.4
Women	2008	51.6
Total	4049	100.0
<b>Age, y<sup>b</sup></b>		
18–29	363	20.4
30–44	991	25.1
45–59	1224	25.3
60 or over	1471	29.1
Total	4049	100.0
<b>Education<sup>b</sup></b>		
High school or less	1279	38.8
Some college	1131	27.6
Bachelor's degree or higher	1639	33.6
Total	4049	100.0
<b>Race or ethnicity</b>		
Hispanic	419	16.3
Non-Hispanic Black	328	11.7
Non-Hispanic other	331	8.6
Non-Hispanic White	2971	63.4
Total	4049	100.0
<b>US region</b>		
Northeast	739	17.6
Midwest	1440	37.9
South	903	20.7
West	967	23.8
Total	4049	100.0
<b>Urban or rural setting<sup>c</sup></b>		
Urban	3227	87.9
Rural	449	12.1
Total	3676	100.0
<b>Annual income, \$<sup>b</sup></b>		
<25 000	405	13.4
25 000–74 999	1342	34.3
$\geq 75 000$	2302	52.4
Total	4049	100.0
<b>Do you currently have any children under the age of 18?<sup>a</sup></b>		
Yes	1275	27.2
No	2768	72.8
Total	4043	100.0

<sup>a</sup> The sample consisted only of individuals who responded to the football-related questions (N = 4049).

<sup>b</sup> The total may not equal 100.0% due to rounding errors.

<sup>c</sup> The total does not add up to 4049 due to missing responses.

<sup>d</sup> Data were weighted to be nationally representative using Current Population Survey distributions based on sex, age, race and ethnicity, education, household income, household size, census region, and metropolitan status.

way the game is played makes injuries common" (57.5%) and "some kids don't know how to tackle correctly" (50.3%). Additionally, an athletic trainer (AT), doctor, or nurse was the most endorsed (62.3%) response option for receiving information on football safety.

Results of the multivariable multinomial logistic regression modeling to examine associations between demographic characteristics, a personal or emotional connection to tackle football, and the primary outcome of interest (ie, a good age to start playing tackle football) are available in Table 3. Individuals who were more likely to support high school age and older as a good age to start playing tackle football had a bachelor's degree or higher (RR = 1.41, 95% CI = 1.14, 1.76) and

**Table 2. Participants' Personal Histories With American Football and Perceptions of and Information Sources for Tackle Football—Based on the 2020 SummerStyles Survey Continued on Next Page**

Characteristic	No.	Weighted Percentage <sup>d</sup>
"I am a fan of American football." <sup>a</sup>		
Strongly agree	1126	25.7
Somewhat agree	1253	31.2
Somewhat disagree	590	14.7
Strongly disagree	1080	28.5
Total	4049	100.0
"How many years did you play tackle football on an organized team (outside PE/gym class)?" <sup>a,b</sup>		
0	3347	84.9
1–4	475	10.8
≥5	189	4.3
Total	4011	100.0
"When is a good age for kids to start playing tackle football?" <sup>a</sup>		
Elementary school age (5–10 y)	480	13.4
Middle school age (11–13 y)	1329	32.8
High school age (14–17 y)	1152	27.8
College age and above (18 y)	235	6.2
Never	843	19.8
Total	4039	100.0
"How concerned are you about the safety of kids playing tackle football?" <sup>a</sup>		
Very concerned	1538	37.1
Somewhat concerned	1983	49.4
Not concerned	523	13.5
Total	4044	100.0
"Which of the following are the top 3 benefits of children playing tackle football?"		
Helps keep kids physically active	2592	65.1
It teaches kids good skills for life (such as teamwork)	2323	55.4
It is fun to play and helps kids make friends	1280	32.5
It helps build a kid's confidence	1319	32.0
It teaches kids to be tough and resilient	654	17.1
It helps kids get out their frustrations in a healthy way	369	10.6
It can help them build skills to play in college or the NFL	322	9.5
They need to have basic football skills to be able to play in high school	299	7.1
Playing football is a big part of our community	134	3.5
Being able to play football is important to our family	14	0.3
Some other benefit not listed	99	2.2
There are no benefits	656	15.2
"Which of the following are the top 3 reasons why kids should not play tackle football?"		
Kids can get concussions or other brain injuries	3406	83.3
Kids can get other kinds of injuries	2700	66.1
It may make kids act more aggressive	1017	26.4
Kids should focus more on school instead of playing sports	722	17.3
Football coaches are too tough on their players	475	11.5
It is too expensive	387	10.7
There are too many practices and games	273	6.8
Some other reason not listed	292	7.4
There are no reasons why kids should not be able to play tackle football	405	10.2
"Which of the following are the top 3 reasons kids may get concussions or other brain injuries while playing tackle football?"		
The way the game is played makes injuries common	2309	57.5
Some kids don't know how to tackle correctly	2037	50.3
A kid's brain isn't fully developed	1811	44.6
Pressure from coaches, parents, or teammates to play rough	1595	38.5
Not following the rules of play	1243	31.4
Poor sportsmanship	903	22.3
Limited on-field supervision by coaches or sports officials/referees	581	14.1
Some other reason not listed	251	6.7
"Where do you or would you go to get information on football safety for yourself or someone you know?" <sup>c</sup>		
An athletic trainer, doctor, or nurse	2551	62.3
Search online (Google)	2129	53.7
Football league or program	1245	32.1
Football coach	1154	29.6
News reports	662	16.3
Friends	523	13.7

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**Table 2. Continued From Previous Page**

Characteristic	No.	Weighted Percentage <sup>d</sup>
Social media (Facebook, Twitter, LinkedIn)	220	6.5
Somewhere else not listed	374	9.0

Abbreviations: NFL, National Football League; PE, physical education.

<sup>a</sup> The instrument is reproduced in its original format. The total does not add up to 4049 due to missing responses.

<sup>b</sup> The questions, “Do you or did you play tackle football on an organized team (outside PE/gym class)?” and, if yes, “How many years did you play tackle football on an organized team (outside PE/gym class)?” were combined to create a variable with 3 levels: 0 y, 1–4 y, and ≥5 y.

<sup>c</sup> Multiple answers could be chosen.

<sup>d</sup> Data were weighted to be nationally representative using Current Population Survey distributions based on sex, age, race and ethnicity, education, household income, household size, census region, and metropolitan status.

did not have children <18 years of age (RR = 1.54, 95% CI = 1.26, 1.90). These participants were also more likely to play tackle football (RR = 4.25, 95% CI = 2.57, 7.03) or played fewer years of tackle football (RR = 2.76, 95% CI = 1.60, 4.77). Finally, these respondents were more likely to be very (RR = 3.94, 95% CI = 2.87, 5.42) or somewhat (RR = 1.88, 95% CI = 1.41, 2.52) concerned about safety and reported no benefit to playing tackle football (RR = 4.02, 95% CI = 2.58, 6.26). Those who were more likely to endorse that children should never start playing tackle football (Table 3) were individuals who had a bachelor’s degree or higher (RR = 2.70, 95% CI = 1.93, 3.78), did not have children under age 18 (RR = 1.54, 95% CI = 1.14, 2.07), were not fans of American football (RR = 3.07, 95% CI = 2.32, 4.06), did not play tackle football (RR = 14.10, 95% CI = 4.87, 40.78) or played fewer years of tackle football (RR = 6.91, 95% CI = 2.24, 21.31), were very concerned about safety (RR = 11.52, 95% CI = 7.32, 18.15), and reported no benefit to playing tackle football (RR = 22.96, 95% CI = 14.30, 36.86).

The results were similar when the data were restricted to parents of children <18 years of age (Supplemental Table 3). Participants who were more likely to support high school age and above as a good age to start playing tackle football did not play tackle football (RR = 5.06, 95% CI = 1.82, 14.10) or played fewer years of tackle football (RR = 3.54, 95% CI = 1.14, 11.00), were very (RR = 5.99, 95% CI = 2.87, 12.49) or somewhat (RR = 2.27, 95% CI = 1.11, 4.65) concerned about safety, and noted no benefit to playing tackle football (RR = 2.01, 95% CI = 1.03, 3.94). Those who were more likely to support children never starting to play tackle football had a bachelor’s degree or higher (RR = 2.75, 95% CI = 1.36, 5.56), were not fans of American football (RR = 3.29, 95% CI = 1.97, 5.47), did not play tackle football (RR = 27.83, 95% CI = 4.44, 174.23) or played fewer years of tackle football (RR = 14.80, 95% CI = 2.12, 103.43), were very concerned about safety (RR = 9.41, 95% CI = 4.06, 21.80), and reported no benefit to playing tackle football (RR = 13.14, 95% CI = 6.59, 26.17).

## DISCUSSION

Based on our findings, although many Americans acknowledged the benefits of children playing football (eg, keeping them physically active and teaching good skills for life), 8 in 10 US adults were concerned about the safety of young children who play tackle football. Moreover, most participants viewed middle school (11 to 13 years of age) or high school (14 to 18 years of age) as a good age to start playing tackle

football. Tackle football has one of the highest rates of injuries, including concussions, among youth athletes.<sup>25–27</sup> Additionally, data from the Youth Risk Behavior Survey indicated that 18.2% of middle school students and 14.3% of high school students self-reported ≥1 sport- or physical activity–related concussions during the previous 12 months.<sup>28</sup>

These results mirror those of prior studies. Warner and Knoester found that 59% of US adults somewhat or strongly disagreed with the appropriateness of kids playing tackle football.<sup>29</sup> Further, adults in their sample who watched or followed football, endorsed football as their favorite sport, played football, were football fans and parents, and had less education were more supportive of children playing tackle football. Among more than 1000 parents, Chrisman et al observed that almost two-thirds (61%) supported age-based restrictions for tackling in youth football.<sup>30</sup> Of those who supported such tackling restrictions, most believed that the age limit should be either middle school (45%) or high school (37%).<sup>30</sup>

Despite the consistency across studies and public support for limiting tackle football to older children, many children start tackle football at ≤9 years of age.<sup>2,31</sup> This may demonstrate a disconnect between public support and football program readiness to support policy changes regarding age-based restrictions. In 1 study,<sup>23</sup> researchers determined that sports organizations and key stakeholders working toward a common goal could successfully take a proactive role and implement policies aimed at athlete safety on a large scale. Future investigators should assess the readiness of programs to make institutional changes regarding age-based restrictions in youth tackle football.

One in 5 of our participants stated that there was never a good age for children to play tackle football. To understand what may drive this view, we assessed the reasons participants gave as to why children should not play tackle football (Table 2). The most common response was that they were concerned about children sustaining concussions and other brain injuries. This outcome is consistent with that of a study that indicated Americans were concerned about concussions and other head injuries in youth football.<sup>32</sup> The second most frequent response was the risk for other kinds of injuries. Concerns about youth tackle football safety may be reflected in a decline in participation among youth and the simultaneous growth of youth in noncontact football (eg, flag football) over the last decade.<sup>1</sup> Although some concerns regarding concussions and other injuries could be eased through safety interventions (ie, “some kids don’t know how to tackle correctly”), most respondents suggested that they believed the risk was

**Table 3. Factors That Affected Supporting High School Age and Older as a Good Age to Play Tackle Football and Never Playing Tackle Football—Based on the 2020 SummerStyles Survey**

Predictors	Outcome: “When Is a Good Age for Kids to Start Playing Tackle Football?”		
	Elementary or middle school age (5–13 y)	High school age and above (≥14 y)	Never
Sex (women versus men)			
RR	REF	0.82	0.98
95% CI		0.67, 1.002	0.74, 1.30
P value		.053	.90
Education (some college versus high school diploma or less)			
RR	REF	1.14	1.31
95% CI		0.90, 1.45	0.90, 1.90
P value		.27	.15
Education (bachelor’s degree or higher versus high school diploma or less)			
RR	REF	1.41	2.70
95% CI		1.14, 1.76	1.93, 3.78
P value		.002	<.001
Do you currently have any children under the age of 18? (no versus yes)			
RR	REF	1.54	1.54
95% CI		1.26, 1.90	1.14, 2.07
P value		<.001	.01
I am a fan of American football. (disagree versus agree)			
RR	REF	1.19	3.07
95% CI		0.98, 1.45	2.32, 4.06
P value		.08	<.001
How many years did you play tackle football on an organized team (outside PE/gym class)? (0 years versus ≥5 years)			
RR	REF	4.25	14.10
95% CI		2.57, 7.03	4.87, 40.78
P value		<.001	<.001
How many years did you play tackle football on an organized team (outside PE/gym class)? (1 to 4 years versus ≥5 years)			
RR	REF	2.76	6.91
95% CI		1.60, 4.77	2.24, 21.31
P value		<.001	.001
How concerned are you about the safety of kids playing tackle football? (very concerned versus not concerned)			
RR	REF	3.94	11.52
95% CI		2.87, 5.42	7.32, 18.15
P value		<.001	<.001
How concerned are you about the safety of kids playing tackle football? (somewhat concerned versus not concerned)			
RR	REF	1.88	1.28
95% CI		1.41, 2.52	0.80, 2.03
P value		<.001	.31
Which of the following are the top 3 benefits of kids playing tackle football? There are no benefits. (yes versus no)			
RR	REF	4.02	22.96
95% CI		2.58, 6.26	14.30, 36.86
P value		<.001	<.001

Abbreviations: PE, physical education; REF, reference group; RR, risk ratio.

inherent to the sport (ie, “how the game is played makes injuries common”). By endorsing later ages for children to start playing tackle football, they were likely signifying less support of children and especially younger children (ie, elementary-age children and younger) assuming injury risks.

Children aged 7 to 12 years may be at increased risk for adverse health outcomes, such as brain-based changes, neurologic conditions, and cognitive and neurodevelopmental

impairment, after a TBI or concussion during a critical period of cognitive and brain development (ie, peaks in myelination and gray matter volumes).<sup>33</sup> Participation in contact sports such as football, a larger head-to-body size ratio, and weaker neck muscles may also increase the concussion risk among adolescents.<sup>10,34</sup> Smith et al demonstrated that age was associated with the head injury risk in football, with younger patients (aged 7 and under) having higher rates of closed head injury than youth aged 8 to 18 years.<sup>35</sup> Additionally, previous injury, worse neuromuscular control, physical fatigue, and increased age were associated with an increased injury risk in youth athletes.<sup>36</sup> Specific to tackle football, Malina et al showed that injury rates among youth football athletes (9 to 14 years old) tended to increase with grade level.<sup>37</sup> Because tackle football remains one of the most popular sports played by children, it is important to develop and test evidence-based, tailored interventions (eg, age-appropriate playing rules, contact restrictions, modifying tackling techniques, helmet design, and injury management) to ensure that children stay healthy and active.

Our results extend those of previous authors and suggest that having an emotional or personal connection to tackle football is a driver for participants’ views on football safety as well as the age at which children should start playing tackle football. For example, participants who reported that children should not play tackle football or endorsed high school age and older as a good age for children to start playing tackle football were less likely to be fans or to have played the sport. However, youth football coaches were generally not supportive of age-based restrictions for youth football.<sup>38</sup> Those who played football and youth football coaches likely draw on their personal experiences when deciding on the appropriate age for athletes to begin tackle football. Future researchers might explore whether football fans and consumers, former football participants, and coaches’ personal experiences serve as barriers to implementing age-based safety changes in youth football. Additionally, an examination of youth perceptions of age-based restrictions and any facilitators of or barriers to implementation would also be important given that youth are key stakeholders.

Athletic trainers play a vital role in safety and concussion prevention efforts, and the presence of ATs is associated with greater concussion identification.<sup>39</sup> Also, ATs help ensure that athletes do not return to play prematurely after a concussion, which decreases the risk of long-term effects of injury. Communication between ATs and various stakeholders (eg, coaches, parents, and athletes themselves) may increase concussion communication, reporting, and adherence to management recommendations.<sup>39,40</sup> As such, a future study that explores how AT presence and communication may influence individuals’ views on age-based restrictions in tackle football may be beneficial.

### Limitations

Our work had multiple limitations. First, the survey questions may not have captured all the reasons that individuals supported or opposed tackle football. Second, the outcome variable (“When is a good age for kids to start playing tackle football?”) is not the same as asking about support for age-based restrictions. Third, the findings regarding a good age to start playing tackle football may or may not be specific to football. Future investigations should address other sports and nonsport activities as comparison groups may shed light on whether reasons to support or oppose age limits or restrictions in football are unique to football or consistent with other sports and

activities. Fourth, the football-related questions on the survey were not standardized or validated, which may have affected the responses and led to bias. Fifth, 43.3% of survey respondents were not fans of American football, and 72.8% did not have children <18 years. These individuals were most likely not the stakeholders with primary concerns about concussion and athlete safety who have asked for institutional changes from sports programs. Finally, some of the variables in the model had very wide 95% CIs due to the small sample size. This was particularly evident in Supplemental Table 3, with the subanalysis limited to parents of children <18 years old. Thus, readers should interpret these outcomes cautiously, as more data from a larger sample size are needed.

## CONCLUSIONS

Although many US adults surveyed acknowledged the benefits of children playing football (eg, keeping children physically active and teaching good skills for life), most were concerned about the safety of young children who play tackle football. Further, more than half of participants viewed middle school (11 to 13 years of age) or high school (14 to 18 years of age) as a good age for children to start playing tackle football. One-fifth reported that there was never a good age to play tackle football. These findings may be used by sports programs to inform future efforts regarding public readiness to support policy changes regarding age-based restrictions. Future authors can assess the readiness of sports programs to make institutional changes and build coalitions to address age-based restrictions in youth tackle football.

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## SUPPLEMENTAL MATERIAL

**Supplemental Table 1.** Comparison of the SummerStyles 2020 sample to the March 2019 census estimates on selected demographic variables.

**Supplemental Table 2.** Bivariate associations between factors and support for a good age for kids to start playing tackle football—2020 SummerStyles survey.

**Supplemental Table 3.** Subanalysis.

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