

Risk of Concussion Based on Position in Men's and Women's Collegiate Soccer

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Abstract:

Identification of correlations between rates of concussion and soccer positions played will lead to improved safety protocols and athlete health. Improvements can be identified by understanding the minutes played per position as fatigue is a risk factor for obtaining a concussion, in training or in game conditions by men and women soccer players. **PURPOSE:** To determine whether a correlation exists between minutes of soccer played, soccer position played, and the incidence of concussion among men and women collegiate soccer players. **METHODS:** Data was collected from 249 players included 80,188 total minutes played, position played, age, and sex for men's and women's soccer players at Cal Poly Humboldt. In addition, data regarding the number of concussions per athlete will be obtained from the North Coast Concussion Program (NCCP). NCCP collects their data from concussed athletes through Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT), self-reported surveys, and athlete reported demographic information.

Goalkeeper:

- Last person to defend and prevent a goal.
- Last line of defense and only position on the field allowed to use hands.
- Position requires athleticism, quick reaction time.
- Concussion risk is more likely due to collision with a player or goal post.

Full Backs:

- Located on either side of the center back and require defensive and attacking responsibilities.
- They should have strong ability to cover both sides of the pitch.
- Concussion risk is more likely due to heading the ball or collision.

Center Backs:

- Most defensive minded position as they play in front of the goalkeeper.
- Required to be vocal communicators as the position allows full field view
- Position requires a higher amount of physical contact and typically is one of the strongest ariel players on the pitch.

Mid Fielders:

- Generate both defense and offense.
- Required to be evenly skilled in both the attacking and defending.
- Cover both ends of the pitch, running long distances.
- Concussion risk is more likely due to collision.

Wide Mid Fielders:

- Have stamina and discipline to provide width and open space for other teammates.
- Precise passes and accurate crosses are needed for this position

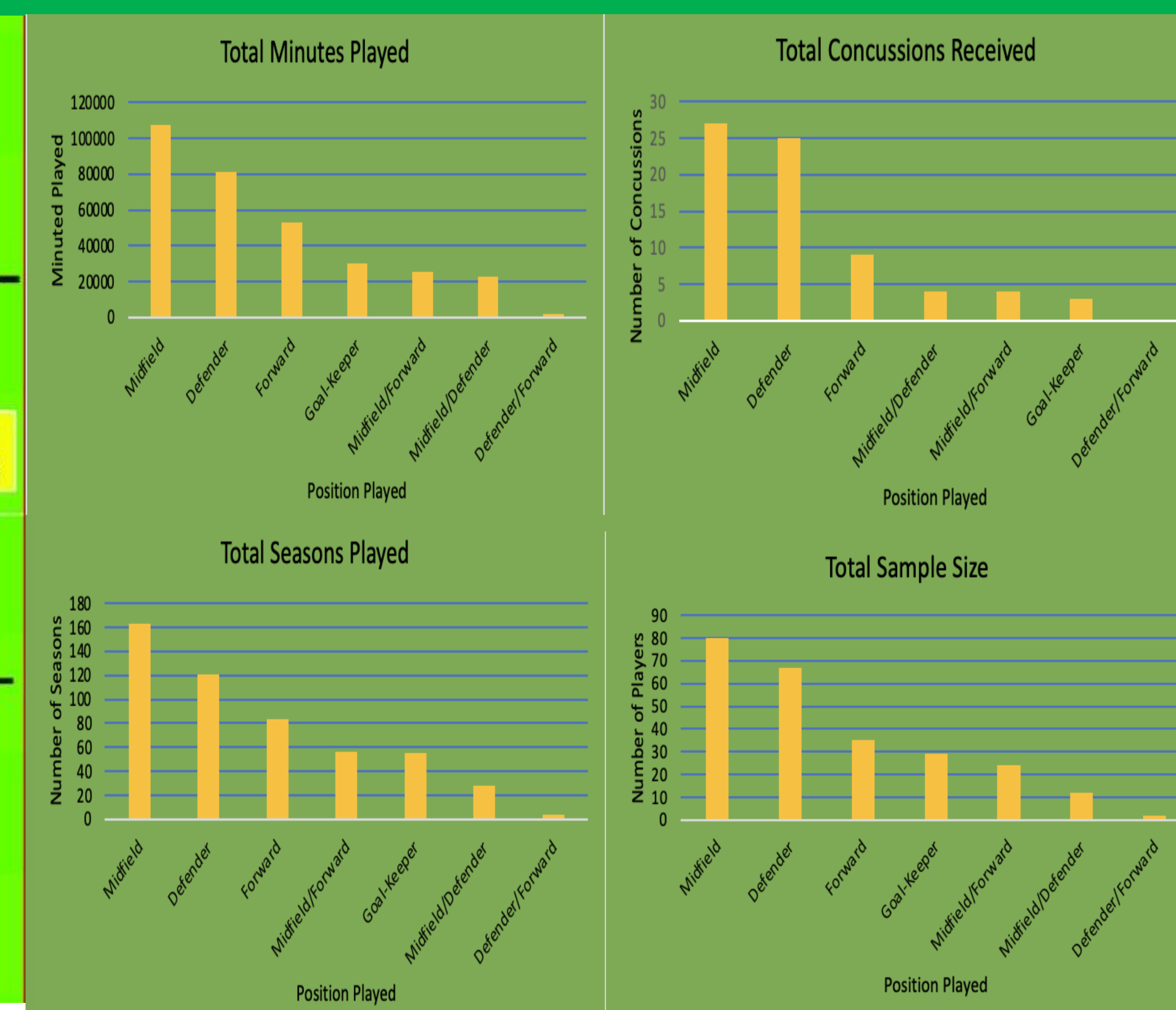
Forwards:

- Anticipate the attack and strive to score a goal.
- Adept at shooting and heading the ball for the main purpose to score.
- Collision is more likely to take place due to heading the ball.

Positions Played in Soccer:



Results Continued:



Introduction:

Head injuries received by athletes have received an increased amount of attention in recent years. There is heightened awareness when this occurs during public sporting events, however the sport of soccer has relatively little information on concussions compared to other popular sports in America. Soccer has quickly become the most popular sport worldwide and notably the most played sport in the United States with significant popularity growth in youth demographics. Due to the increasing amount of research on the impact of concussions there is a growing awareness of the risk of concussion in the game of soccer.

- Soccer is the world's most popular sport
 - 250 million players internationally
 - Largest youth sport in the United States
 - 45,000 NCAA collegiate soccer players (Playing, 2021)

- The Centers for Disease Control (CDC) estimates indicate sports related concussions (SRC) have increased from 1.6 million to over 3.0 million per year (CDC, 2019)

- The American Academy of Pediatrics has recently ranked soccer to the equivalent of American football and ice hockey, with a comparable frequency of head injury (Weber, 2016)

Methods:

The main purpose of this study is to determine if there is a correlation between minutes played, position played and the incidence of concussion when playing collegiate soccer. Data will be obtained from Cal Poly Humboldt athletics and the North Coast Concussion Program (NCCP). This data will be used to determine what relationship exists between soccer positions, minutes played and the incidence of concussion. These findings may assist in mitigation techniques to reduce the risk of concussion in collegiate athletes. The methods section describes how this research will be conducted and includes the following: research design, participants, procedures, hypothesis, and proposed data analysis.

Participants:

- 250 participants in total
- Male and female Cal Poly Humboldt soccer players ranging in age from 17 to 26
- Participants played soccer for Cal Poly Humboldt between 2011-2021
- Participants played varied soccer positions with varied amounts of playing time
- *Inclusion criteria:* Male and female Cal Poly Humboldt soccer athletes between the ages of 17 and 26
- *Exclusion criteria:* Any athlete except soccer players, Cal Poly Humboldt collegiate soccer players younger than 17 and older than 26

Conclusion:

- **There is a strong correlation between concussion risk and position played.**
- Utilized multiple regression analysis in reviewing relationships between soccer positions played, minutes played, and the incidence of concussion.
- In this study, Cal Poly Humboldt men's and women's soccer players ranging in age from 17 to 26 were evaluated through data available through the North Coast Concussion Protocol and Humboldt's athletic department.
- Notably additional research should be done for gender variation.
- Further analysis of how the concussion is received (collision, ground, heading the ball, and equipment contact) should also be explored.
- This study should provide data and information to athletic trainers and coaches regarding risk and provide the opportunity to mitigate those risks with improved training techniques and/or equipment modifications.
- Follow up studies should take place to further review physical fitness and training techniques that reduce concussion by position.

Hypothesis and Purpose:

- Investigate what soccer position(s) are at highest rate and risk for being concussed

The hypothesis of this research is that the soccer positions with the greater physical demands may lead to increased fatigue which leads to an increased rate or risk of concussion. Concussions will be reviewed by position. I predict that the forward position will be most concussed position due to the part of the field they play in and role that is required from the player. While specifically reviewing for a correlation between position played and incidence of concussion, analysis will also be done on minutes played. If there is a correlation between position played and incidence of concussion, additional analysis on the specific physical demands of the positions will be needed.

Purpose:

- Safety of athletes!
- Identification of improved training protocols
- Identification of protective equipment
- Rest requirements
- Increased rotation on and off the field

Results:

Position	Sample Size	Total Seasons	Minutes Played	#ofConcussions
Goal-Keeper	29	55	29891	3
Defender	67	121	80887	25
Defender/Forward	2	4	2232	0
Midfield/Defender	12	28	22518	4
Midfield	80	163	107083	27
Midfield/Forward	24	56	25547	4
Forward	35	83	53074	9
Total	249	510	321232	72

Midfielders:

- Highest number of concussions overall
- Highest concussion based on minutes played
- Highest concussion rate based on number of seasons played

There is a strong correlation between concussion risk and

- Position Played
- Number of seasons played by position
- Number of minutes played

Citations:

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