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Analysis of corner kicks at the FIFA Women's World Cup 2019 in relation to match status and team quality

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ABSTRACT

This study analysed the characteristics of 476 corner kicks taken during 52 matches at the FIFA women's World Cup 2019. The effect of current match status/team quality was examined, and the corner characteristics associated with the 17 goals scored from corners (3.6%) and 93 shots on-target (19.5%) were identified. Goals from corners were more likely from dynamic attacks or with 1–4 defenders for short corners. Shots on-target were more likely from corners delivered into GA3&CA3 and the outer zones, ≥6 attackers were inside the delivery area or involved ≥3 intervening attackers. Match status was significantly associated with number of defenders, attackers for short corners, defenders for short corners and type of marking. Team quality was significantly associated with type of delivery, kicking foot, number of attackers, attackers for short corners, defenders for short corners, defenders on posts, number of intervening attackers and offensive organisation. Team quality was not significantly associated with corner outcomes, perhaps a consequence of higher-quality teams not always favouring corner characteristics which are associated with increased success (goals or shots on-target). These results can assist coaches to understand corner characteristics to expect when winning, drawing, or losing, or against different levels of opposition within women's international football.

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Performance analysis; set pieces; football; soccer; corner kicks

1. Introduction

The success of recent women's international football tournaments has led to the rapid development of women's football across the globe, increasing the popularity of the women's game (Kubayi & Larkin, 2020; Wang & Qin, 2020). The FIFA Women's World Cup (FWWC) 2019 was the most watched women's world cup of all time, with the final match alone being watched live by 264 million people (FIFA, 2019). Over recent years, the number of match analysis studies investigating women's football has also increased, examining shooting and goal scoring patterns (Mara et al., 2012; Wang & Qin, 2020), corner kicks (Beare & Stone, 2019), and free kicks (Alcock, 2010). Overall, football coaches and players will use tactics that aim to increase the likelihood of scoring goals (Mara et al., 2012) as the winner of a football match is the team that has scored the most goals (International Football Association Board, 2020).

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Goals in football can be scored through open play or set pieces (Pulling, 2015). Set pieces (e.g., free kicks, corners, penalties and throw-ins) restart football matches after the ball has left play or a foul has been committed. During set pieces the dynamism of open play is temporarily removed as the ball is stationary and opponents must be positioned a certain distance away from the ball (Maneiro et al., 2019). Although contextual variables can vary between set pieces, during an individual set piece the situation is stable and has high contextual certainty, which is advantageous for the set-piece taker (Maneiro et al., 2019). Therefore, the probability of scoring from a set piece is higher (1.8%) than the probability of scoring from open play (1.1%) (Power et al., 2018). Consequently, set pieces have been identified as critical components of offensive performance (Beare & Stone, 2019; Strafford et al., 2019).

At the 2010 FIFA Men's World Cup (FMWC), 35 of the 145 goals (24%) came from set pieces (Njororai, 2013). More recently, a systematic review of men's international football and the English Premier League (2012–2016) reported that 30–40% of goals came from set pieces (Sarmento et al., 2018). Power et al. (2018) demonstrated that there is a 2.1% chance of scoring from a corner compared to 1.1% from free kicks. In 1,139 corners from 124 matches at the 2010 FMWC, UEFA Euro 2012 and UEFA Champions League 2010–2011, 26.0% of corners resulted in a shot, 9.8% produced a shot on-target but only 2.2% ended with a goal (Casal et al., 2015). This inefficient percentage of corners resulting in a goal has been repeatedly found within men's football with percentages of 2.2% to 4.1% being reported (Casal et al., 2015; Pulling, 2015; Pulling et al., 2013; Sainz De Baranda & Lopez-Riquelme, 2012). Consequently, 24 to 45 corners are required for a goal to be scored from a corner (Sarmento et al., 2018). This is problematic because previous research in both men and women's football have reported that only a mean of 10 corners are performed per game (Beare & Stone, 2019; Casal et al., 2015; Sainz De Baranda & Lopez-Riquelme, 2012; Siegle & Lames, 2012). However, a goal being scored from a corner meant a victory or a draw for the scoring team in 76% of cases in men's international and club tournaments (Casal et al., 2015) and 69% of occasions in the men's EPL 2015–2016 (Strafford et al., 2019). Consequently, several studies have attempted to identify corner characteristics which result in an increased likelihood of shots, shots on-target and goals from corners (Beare & Stone, 2019; Casal et al., 2015; Sainz De Baranda & Lopez-Riquelme, 2012; Strafford et al., 2019) as well as aspects of defending corners (Kubayi & Larkin, 2019; Pulling & Newton, 2017). This information can be used to improve the ability for coaches to replicate corners from actual competition during their training sessions (Sainz De Baranda & Lopez-Riquelme, 2012). However, research examining corner kicks within women's football in the same level of detail as for men's football is currently lacking, especially at international level.

Football is a complex sport involving external and unanticipated variables which coaches attempt to control to increase their team's chances of success (Armatas et al., 2007). Therefore, research suggests that both the context and contextual factors must be considered in football performance analysis (Casal et al., 2017). Every set piece is subject to differences in contextual variables which may explain the low effectiveness of corners (Maneiro et al., 2019). For example, differences in match status/match outcome (Casal et al., 2015; Liu et al., 2015; Sainz De Baranda & Lopez-Riquelme, 2012), match half/time period (Borrás & Sainz De Baranda, 2005; Casal et al., 2015; Gomez et al., 2013), team

quality (Liu et al., 2015; Gomez et al., 2013) and match location (Liu et al., 2015) can influence corner characteristics.

Match status involves three categories: winning, drawing and losing, and is important to consider because it can influence the technical and tactical behaviours of teams and players (Casal et al., 2017; Sainz De Baranda & Lopez-Riquelme, 2012). When considering corners, match status has been reported to significantly influence different corner characteristics, including type of delivery, delivery area, number of attackers and the number of defenders located by the goalposts in men's football (Casal et al., 2017; Sainz De Baranda & Lopez-Riquelme, 2012). Teams were also significantly more likely to score from corners when drawing or winning, than losing (Strafford et al., 2019).

When concerning team quality, early studies classified teams as "successful/unsuccessful" based on their performance in tournaments (Grant et al., 1999), or "strong/weak" based on final league table standings (Gomez et al., 2013). For international tournaments, team quality can be classified based on the FIFA/Coca-Cola World Ranking, which is a ranking system for national football teams that is used to seed draws for international tournaments (Wunderlich & Memmert, 2016). This is because previous match results, match location, match importance and the difference in ranking between teams are all considered, meaning teams are ranked according to a value that is a measure of their actual strength (FIFA.com, 2020). Team quality has been reported to significantly influence different corner characteristics, including delivery type, attacking organisation, number of defenders and type of marking in men's football (Strafford et al., 2019).

Football performance analysis has been dominated by men's leagues and competitions, whereas limited research has investigated female football, even when differences in technical, tactical, and physical attributes between males and females have been established (Althoff et al., 2010; Mara et al., 2012). Most studies examining goal-scoring strategies focus on men's football, especially when considering set pieces (Mara et al., 2012). Although Alcock (2010) analysed free kicks taken at the 2007 FIFA Women's World Cup (FWWC), Mara et al. (2012) recommended that future studies should consider variables contributing to goals from other set pieces such as corners. Until recently, no research had explored the importance of corners in professional women's football (Beare & Stone, 2019). Consequently, Beare and Stone (2019) analysed the characteristics and effectiveness of corners from the Football Association Women's Super League 2017–2018 and identified whether delivery type, delivery area or offensive organisation were related to shots on-target and goals. Overall, 4.6% of corners resulted in a goal, with 38 of the 282 goals scored during the season coming from corners. This percentage of 4.6% is above the 2.2% to 4.1% of corners resulting in goals observed in men's football (Casal et al., 2015; Pulling, 2015; Pulling et al., 2013; Sainz De Baranda & Lopez-Riquelme, 2012), indicating that there could be a difference between men and women's football in relation to corner kicks. Recent studies have therefore suggested that it is necessary for future research to investigate corner kicks in women's international football tournaments (Kubayi & Larkin, 2020).

An analysis of current performance trends, including the influence of contextual variables and using data from recent major international tournaments, could provide information on corner characteristics which are related to an increased likelihood of scoring goals. Therefore, the aims of this study were to describe how corner kicks were taken by women's international football teams during the 2019 FIFA Women's World

Cup, to examine the effect of current match status and team quality on corner characteristics and corner outcomes, and to identify corner characteristics associated with goals and shots on-target from corners.

2. Methods

2.1. Match data

The 2019 FIFA Women's World Cup (FWWC) involved twenty-four international women's football teams competing in 52 matches (36 group stage and 16 knockout stage). Overall, 476 of the 478 corner kicks that were taken during the tournament were analysed in this study. Two corners taken during one group stage match (Chile versus Sweden) were not analysed as the match was interrupted by poor weather conditions which disrupted recording.

All 52 matches were observed post-match through broadcast coverage provided by the British Broadcasting Corporation. The matches were recorded from television emitted images using a Freeview HD Recorder (London, England) and an AGPtek HD Video Capture (Guangzhou, China) which were then stored on an external hard drive. The study did not involve any verbal or physical contact with the players as data were collected via observation of matches available in the public domain. The University ethics committee granted approval for the study prior to data collection.

Corner kicks were defined as occurring when the whole ball crosses the goal line after touching a defending player, and a goal is not scored (International Football Association Board, 2018). The corners were analysed by the same observer using Dartfish 10 Live S analysis software (Fribourg, Switzerland) which enables video recordings to be paused, replayed, played in slow-motion and scrolled through frame by frame to increase tagging accuracy (Sainz De Baranda & Lopez-Riquelme, 2012). Coding was completed by the same observer in two two-hour sessions per day with at least half an hour break between sessions to reduce the likelihood of errors due to coding fatigue.

2.2. Coding system and variable definitions

The language describing how balls enter the delivery area from corners can be ambiguous. Figure 1 demonstrates how the current study categorised the variables associated with the delivery of corner kicks.

The system used to code the corner kick characteristics was largely based on Casal et al.'s (2015) coding system, including adaptions influenced by other previous research which are indicated within Table 1. Short corners occur when the ball is kicked to a teammate in close proximity to the initial corner taker and does not immediately enter the delivery area (Beare & Stone, 2019; Sainz De Baranda & Lopez-Riquelme, 2012). Therefore, attackers in a position to receive a short corner were not included within the number of attackers as they are outside the delivery area. The zones for corner kick delivery area and a potential short corner are illustrated in Figure 2. Corners were considered complete when the ball did not immediately return to the corner kick delivery area having already been within the delivery area (Beare & Stone, 2019; Pulling et al., 2013).

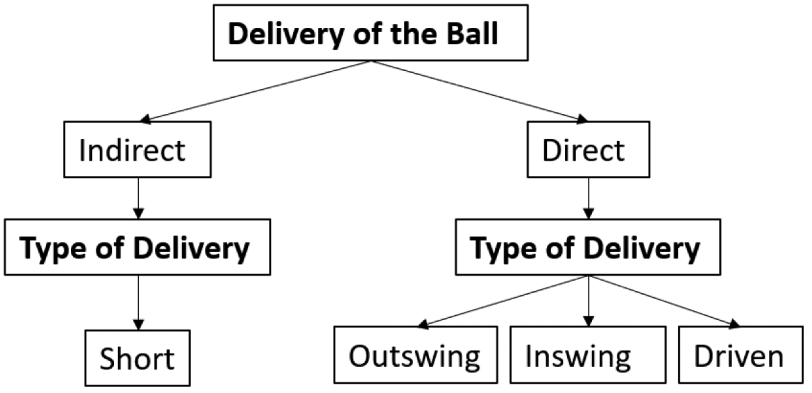

Figure 1. Categorisation of variables associated with the delivery of the ball and type of delivery.

The system used to code the corner kick outcomes was adapted from Sainz De Baranda and Lopez-Riquelme (2012) with the operational definitions listed within Table 2. The match status contextual variable category was classified on whether the team taking the corner was currently winning, losing or drawing. Team quality classification was determined from the FIFA/Coca-Cola World Ranking (FIFA.com, 2019) using the last update before the tournament commenced (29 May 2019) (Wunderlich & Memmert, 2016). High-quality, medium-quality and low-quality classifications corresponded to the eight highest, middle and lowest ranked teams participating in the tournament respectively.

2.3. Intra-observer reliability

Intra-observer reliability was assessed by analysing 36 corners a second time by the same observer four weeks after the initial analysis (Viera & Garrett, 2005). The Kappa statistic assessed the level of intra-observer agreement (Viera & Garrett, 2005), and based on the interpretations of Viera and Garrett (2005), the resultant mean kappa statistic ($k = 0.90$) indicated an almost perfect level of intra-observer reliability agreement.

2.4. Data analysis

After the corners had been analysed, the data were exported into Microsoft Excel 2016 (Version 1908, Microsoft Corporation, USA) to calculate the relative frequencies of each corner characteristic and corner outcome. The data were analysed further by IBM SPSS Statistics (Version 25 IBM Corp., USA) where chi-square tests examined the associations between: (1) match status and corner characteristics, (2) team quality and corner characteristics, (3) match status and corner outcomes, (4) team quality and corner outcomes, (5) corner characteristics and shots on-target and goals. An assumption of the chi-square test is that the expected values must not be below five (Field, 2017). To prevent this assumption being violated the GA1 and CA1 (GA1&CA1), GA3 and CA3 (GA3&CA3), and the front zone, back zone and edge zone (Outer Zone) delivery areas were combined (Beare & Stone, 2019). The number of attackers was

Table 1. Corner kick characteristics with associated variables and definitions. Adapted from Casal et al. (2015) or otherwise indicated.

Category	Variables and Definitions
Position of corner	Right: Right side of pitch when facing goal. Left: Left side of pitch when facing goal.
Kicking foot	Right Foot: Corner taken the right foot. Left Foot: Corner taken with left foot.
Delivery of ball	Direct: Ball sent to delivery area with one touch (from the initial corner-taker). Indirect: Ball sent to delivery area after several touches from corner-taking team.
Type of delivery Adapted from Beare and Stone (2019) and Sainz De Baranda and Lopez-Riquelme (2012.	Inswing: Ball is kicked through the air and curves towards goal. Outswing: Ball is kicked through the air and curves away from goal. Driven: Ball is kicked either through the air or along the ground with pace but no curve. Short: Ball is kicked to teammate in 'zone for a potential short corner' (Figure 2) and does not immediately enter delivery area. Once a short corner is taken it can be kicked into delivery area.
Delivery Area Adapted from Beare and Stone (2019), Strafford et al. (2019), Pulling (2015) and Taylor et al. (2005).	Delivery area: Nine zones located inside and at the edge of the 18-yard box (Figure 1). Ball can enter delivery area either from a direct delivery or from a cross after an initial short corner. The goal area (6-yard box) was divided into three zones: goal area 1 (GA1), goal area 2 (GA2) and goal area 3 (GA3). The critical area (located between the 6-yard box and penalty spot and covering the width of the 6-yard box) was also divided into three zones: critical area 1 (CA1), critical area 2 (CA2) and critical area 3 (CA3). The two central zones (GA2 and CA2) cover the width of the goal. Front zone: Covers the area outside the 6-yard box closest to the corner-taker and is the length of the 18-yard box. Back zone: Covers the area outside the 6-yard box furthest from the corner-taker and is the length of the 18-yard box. Edge zone: An area the width of the 6-yard box located between the penalty spot and the edge of the semi-circle of the 18-yard box. Did not enter: Ball does not contact a player inside delivery area.
Path of ball	Ground: Ball is delivered to delivery area rolling along ground at all moments. Air: Ball is delivered to delivery area through the air having left the ground at some point.
Number of attackers	Number of players from corner-taking team inside delivery area: (0–1), (2–3), (4–5), (6–7), (8+).
Number of defenders	Number of players from defending team inside delivery area: (2–3), (4–5), (6–7), (8+).
Interaction context	Numerical inferiority: number of attackers < number of defenders. Numerical equality: number of attackers = number of defenders. Numerical superiority: number of attackers > number of defenders.
Attackers for short corner	Number of players from corner-taking team inside "zone for a potential short corner": (0), (1–2), (3–4)
Defenders for short corner	Number of players from defending team inside "zone for a potential short corner": (0), (1–2), (3–4)
Number of intervening attackers	Number of players from corner-taking team attacking and interacting with ball after initial corner: (0), (1–2), (3–4), (5+)

(*Continued*)

Table 1. (Continued).

Category	Variables and Definitions
Number of defenders on posts Adapted from Kubayi & Larkin and Sainz De Baranda and Lopez-Riquelme (2012).	Front post: Defender positioned on first post closest to corner being taken. Back post: Defender positioned on second post furthest from corner being taken. Both posts: Defenders positioned on both goalposts. No posts: No defenders positioned on either goalpost.
Offensive organisation Adapted from Beare and Stone (2019).	Static: Players on corner-taking team stay in set positions inside delivery area throughout corner. Dynamic: Players on corner-taking team vary their positions inside delivery area throughout corner.
Type of marking Adapted from Strafford et al. (2019) and Sainz De Baranda and Lopez-Riquelme (2012).	Player-to-player: Defenders inside delivery area are positioned against an attacker prior to corner. Zonal: Defenders inside delivery area are positioned to cover a particular space prior to corner. Mixed: Combination of player-to-player & zonal marking.

collapsed to 0–5 or ≥6, number of defenders was collapsed to 0–7 or ≥8, attackers for short corners and defenders for short corners were replaced with either 0 or 1–4, and number of intervening attackers was collapsed to 0–2 or ≥3. Superiority for the interaction context was removed as this did not occur. Shot variations were combined into the categories of goals, shots on-target and shots off-target. Where combining variables was not possible meaning the assumption had been violated, the Fisher's Exact Test value was used to assess association significance (Field, 2017). Cramer's V (V) effect sizes were calculated and described as small (V = 0.10), medium (V = 0.30) or large (V ≥ 0.50) as used previously by Beare and Stone (2019). A significance level of $p < 0.05$ was used for all analyses.

3. Results

3.1. Tournament corners and goals

A total of 476 corner kicks were analysed in the current study, resulting in a mean of 9.2 corner kicks per match. Overall, 146 goals were scored during the tournament, with 17 of these goals coming from corners. Therefore, 11.6% of all goals scored during the tournament came from corners, with 3.6% of corners resulting in a goal. Table 3 displays the descriptive statistics for all corner outcomes.

3.2. Corner characteristics

The frequencies for each of the variables coded from the 476 corner kicks analysed are displayed within Table 4. The most frequent corner characteristics were direct corners (89.3%), in-swinging deliveries (53.2%), paths through the air (90.1%), deliveries to CA2 (22.9%), the right pitch side (58.2%), the right kicking foot (58.2%), 4 to 5 attackers (50.4%), ≥ 8 defenders (82.8%), an inferior interaction context (99.4%), a defender positioned only on the front post (51.0%), 1 to 2 intervening attackers (54.8%), at least on defender for a short corner (56.3%), zero attackers for a short corner (54.0%), dynamic offensive organisation (61.1%) and mixed marking (43.1%).

Table 2. Corner kick outcomes with associated variables and definitions. Adapted from Sainz De Baranda and Lopez-Riquelme (2012).

Category	Variables and Definitions
Corner kick outcomes	Shooting outcome variables includes shots from penalties that occur during the corner play. Goal: Corner-taking team scores a goal. Shot on-target – deflected: Shot is going within goalposts and below crossbar but is blocked by a defender or goalkeeper but is not controlled/held. Shot on-target – saved: Shot is going within goalposts and below crossbar but is saved by the goalkeeper who holds onto the ball, resulting in the end of that corner play. Shot off-target – deflected: Shot is going wide of goalposts/above crossbar but is blocked by a defender or goalkeeper and is not controlled/held. Shot off-target – saved: Shot is going wide of goalposts/above crossbar but is saved by the goalkeeper who holds onto the ball, resulting in the end of that corner play. Shot off-target – out of play: Shot is going wide of goalposts/above crossbar and goes out of play. Clearance/punch – defence/goalkeeper: Ball is kicked/headed by a defending player or punched by the goalkeeper in an attempt to clear the ball away from the delivery area. Goalkeeper catch: Goalkeeper catches ball directly from corner delivery. Attacking team free kick – defending team foul: Corner-taking team win a free kick after being fouled by the defending team. Defending team free kick – attacking team foul: Defending team win a free kick after being fouled by the corner-taking team. Defending team free kick – attacking team offside: Defending team win a free kick after a player on the corner-taking team is ruled offside during the corner play. Unsuccessful pass: Corner play ends with an unsuccessful pass from the corner-taking team and the defending team regains possession. Ball goes out of play: Corner delivery goes out of play.

Table 3. Descriptive analysis of corner kick outcomes.

Corner Outcome		Overall	
Category	Variable	N	%
Total corners		476	100.0%
Goal		17	3.6%
Shot on-target	Shot on-target – deflected	61	12.8%
	Shot on-target – saved	32	6.7%
Shot off-target	Shot off-target – deflected	26	5.5%
	Shot off-target – saved	7	1.5%
	Shot off-Target – out of play	83	17.4%
Clearance/punch – defence/GK		164	34.5%
Goalkeeper catch		30	6.3%
Free kick	Attacking team free kick – defending team foul	1	0.2%
	Defending team free kick – attacking team foul	18	3.8%
	Defending team free kick – attacking team offside	1	0.2%
Attacking error	Unsuccessful pass	12	2.5%
	Out of play	24	5.0%

These are the most frequent corner characteristics, but this does not imply they are all interlinked.

3.3. Corner characteristic associations with match status

Match status was significantly associated with the number of defenders (χ^2 2 = 28.357, $p < 0.001$, V = 0.244), attackers for short corners (χ^2 2 = 13.064, p = 0.001, V = 0.166), defenders for short corners (χ^2 2 = 7.824, p = 0.020, V = 0.128), and type of marking (χ^2 4 = 36.058, $p < 0.001$, V = 0.195) (Table 4).

When the corner-taking team was winning they favoured positioning players inside the zone for a potential short corner (53.0%) and the defending team preferred positioning 0–7 defenders inside the delivery area (28.7%), positioned at least one player inside the zone for a potential short corner (65.2%) and utilised player-to-player marking (33.5%) or mixed marking (45.1%).

When the corner-taking team was drawing they favoured positioning attackers for short corners (48.1%) and the defending team preferred positioning ≥8 defenders inside the delivery area (85.9%), positioning no defenders for short corners (47.6%), player-to-player marking (39.8%) and were less likely to use zonal marking (19.9%).

When the corner-taking team was losing they preferred positioning zero attackers for short corners (68.9%) and the defending team favoured positioning ≥8 defenders inside the delivery area (95.3%), positioning zero defenders for short corners (49.1%), zonal marking (43.4%) and were less likely to use player-to-player marking (11.3%).

No significant associations were observed between match status and corner position, delivery of ball, type of delivery, kicking foot, path of ball, delivery area, number of attackers, interaction context, number of intervening attackers, number of defenders on posts and offensive organisation.

3.4. Corner characteristic associations with team quality

Team quality was significantly associated with delivery of the ball (χ^2 2 = 6.206, p = 0.045, V = 0.114), type of delivery (χ^2 6 = 36.067, p < 0.001, V = 0.195), kicking foot (χ^2 2 = 33.484, p < 0.001, V = 0.265), number of attackers (χ^2 2 = 10.360, p = 0.006, V = 0.148), attackers for short corner, (χ^2 2 = 18.408, p < 0.001, V = 0.197), defenders for short corner (χ^2 2 = 10.452, p = 0.005, V = 0.148), number of intervening attackers (χ^2 2 = 12.642, p = 0.002, V = 0.158), number of defenders on posts (χ^2 6 = 44.732, p < 0.001, V = 0.217) and offensive organisation (χ^2 2 = 17.086, p < 0.001, V = 0.189).

High-quality teams favoured indirect corners (13.5%), driven (29.1%) and short deliveries (13.1%), the right foot (68.5%), positioning 0–5 attackers inside the delivery area (58.2%), positioning attackers for short corner (55.0%), using ≥3 intervening attackers (18.1%) and dynamic attacks (69.3%). When high-quality teams took corners, defending teams preferred positioning defenders for short corner (62.5%) and positioning no defenders on posts (42.2%).

Medium-quality teams favoured in-swinging deliveries (68.5%), the left foot (59.9%), positioning ≥6 attackers in the delivery area (58.0%), not positioning attackers for short corners (61.7%), using 0 to 2 intervening attackers (91.4%) and dynamic attacks (54.9%) but were less likely to utilise driven deliveries (9.3%). The defending team favoured positioning defenders on both posts when medium-quality teams took corners (26.5%).

Low-quality teams favoured direct corners (96.8%), driven (33.3%) and out-swinging deliveries (17.5%), the right foot (63.5%), not positioning attackers for short corners (69.8%), using 0 to 2 intervening attackers (95.2%), static attacks (55.6%) and positioned 0–5 and ≥6 attackers in the delivery area evenly. When the corner-taking team was low-quality the defending team favoured not positioning defenders for short corner (58.7%), positioning a defender on the front post (66.7%). There were no significant associations

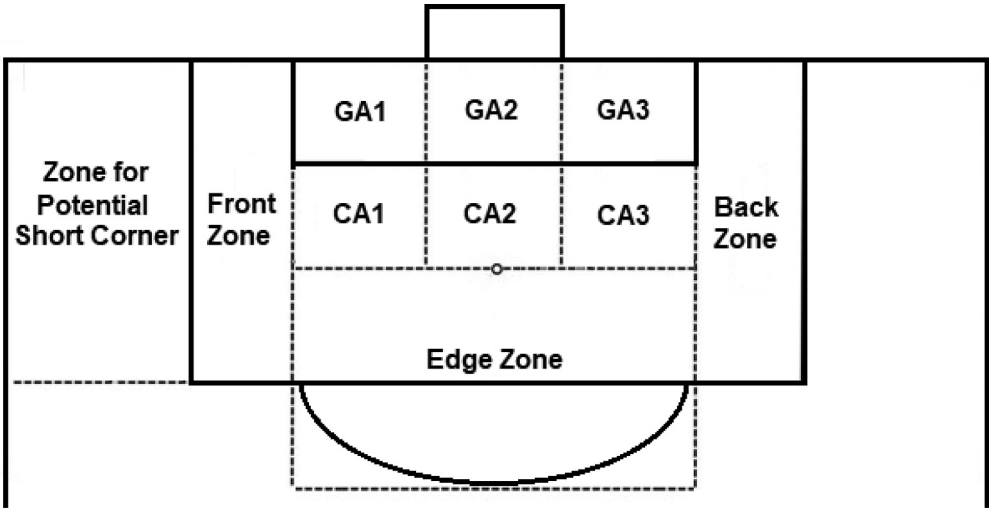

Figure 2. Zones for corner kick delivery area and for potential short corner. Adapted from Beare and Stone (2019), Strafford et al. (2019), and Pulling (2015) and Taylor et al. (2005).

between team quality and corner position, path of ball, delivery area, number of defenders, interaction context, and type of marking.

3.5. Corner outcome associations with match status/team quality

Table 5 shows that there were no significant associations between match status or team quality and goals, shots on-target (excluding goals), shots off-target, clearances/punches from the defence/goalkeeper, goalkeeper catches, free kicks for either team or an unsuccessful pass/when the ball goes out of play.

3.6. Corner characteristic associations with shots on-target (excluding goals) and goals

The results of the bivariate analysis with contingency tables to analyse the influence of corner kick characteristic variables on success, classified as Shots on-target or Goals, is displayed in Table 6. Shots on-target (excluding goals) were significantly associated with the delivery area (χ^2 5 = 14.957, p = 0.011, V = 0.177), number of attackers (χ^2 1 = 4.396, p = 0.036, V = 0.096) and number of intervening attackers (χ^2 1 = 10.440, p = 0.001, V = 0.148).

Shots on-target were more likely to occur when corners were delivered into GA1&CA1 (20.9%), GA3&CA3 (25.0%) and the outer zones (31.7%). Shots on-target were less likely to occur when corners were delivered to GA2, (15.2%) and CA2 (17.4%). Shots on-target were more likely to occur when ≥6 attackers were inside the delivery area (23.5%) when compared to 0 to 5 attackers (15.9%). The likelihood of a shot on-target also increased as the number of intervening attackers increased. Only 17.8% of corners led to a shot on-target when involving 0 to 2 intervening attackers, whereas 39.5% of corners involving ≥3 intervening attackers led to a shot on-target.

Table 4. Corner kick characteristics in relation to match status and team quality.

Corner Characteristics			Overall	Match Status				Team Quality			
				Winning	Drawing	Losing	χ2	High	Medium	Low	χ2
Category	Variable	N	%	%	%	%		%	%	%	
Total Corners		476	100.0%	34.4%	43.3%	22.3%		52.7%	34.0%	13.3%	
Position	Right	269	56.5%	55.5%	54.4%	62.3%	1.88	56.6%	54.3%	61.9%	1.06
	Left	207	43.5%	44.5%	45.6%	37.7%		43.4%	45.7%	38.1%	
Delivery of ball	Direct	425	89.3%	86.0%	90.3%	92.5%	3.21	86.5%	90.7%	96.8%	6.21*
	Indirect	51	10.7%	14.0%	9.7%	7.5%		13.5%	9.3%	3.2%	
Type of delivery	In-swinging	253	53.2%	48.2%	57.3%	52.8%	10.41	45.4%	68.5%	44.4%	36.07**
	Out-swinging	63	13.2%	13.4%	9.7%	19.8%		12.4%	13.0%	17.5%	
	Driven	109	22.9%	24.4%	23.8%	18.9%		29.1%	9.3%	33.3%	
	Short	51	10.7%	14.0%	9.2%	8.5%		13.1%	9.3%	4.8%	
Kicking foot	Right	277	58.2%	57.9%	58.7%	57.5%	0.05	68.5%	40.1%	63.5%	33.48**
	Left	199	41.8%	42.1%	41.3%	42.5%		31.5%	59.9%	36.5%	
Path of ball	Air	429	90.1%	89.0%	90.8%	90.6%	0.35	89.2%	91.4%	90.5%	0.51
	Ground	47	9.9%	11.0%	9.2%	9.4%		10.8%	8.6%	9.5%	
Delivery area	GA1	80	16.8%	23.8%	25.2%	17.9%	10.40	23.9%	25.3%	14.3%	9.81
	CA1	30	6.3%								
	GA2	99	20.8%	20.1%	22.8%	17.9%		17.5%	22.8%	28.6%	
	CA2	109	22.9%	23.2%	19.4%	29.2%		21.6%	21.6%	28.6%	
	GA3	25	5.2%	12.2%	14.1%	10.4%		14.7%	11.1%	7.9%	
	CA3	35	7.4%								
	Front zone	23	4.8%	12.8%	10.7%	18.9%		13.5%	13.0%	12.7%	
	Back zone	8	1.7%								
	Edge zone	32	6.7%								
	Did not enter	35	7.4%	7.9%	7.8%	5.7%		8.0%	6.2%	7.9%	
Number of attackers	0 to 1	1	0.2%	53.0%	52.4%	48.1%	0.71	58.2%	42.0%	50.8%	10.36**
	2 to 3	4	0.8%								
	4 to 5	241	50.6%								
	6 to 7	222	46.7%	47.0%	47.6%	51.9%		41.8%	58.0%	49.2%	
	8+	8	1.7%								
Number of defenders	2 to 3	1	0.2%	28.7%	14.1%	4.7%	28.36**	18.7%	14.8%	15.9%	1.13
	4 to 5	1	0.2%								
	6 to 7	79	16.6%								
	8+	395	83.0%	71.3%	85.9%	95.3%		81.3%	85.2%	84.1%	
Interaction context	Inferiority	473	99.4%	99.4%	99.0%	100.0%	1.06	99.6%	98.8%	100.0%	1.56
	Equality	3	0.6%	0.6%	1.0%	0.0%		0.4%	1.2%	0.0%	

(*Continued*)

Table 4. (Continued).

Corner Characteristics					Match Status				Team Quality		
Attackers for short corner	0	257	54.0%	47.0%	51.9%	68.9%	13.06**	45.0%	61.7%	69.8%	18.41**
	1 to 2	217	45.6%	53.0%	48.1%	31.1%		55.0%	38.3%	30.2%	
	3 to 4	2	0.4%								
Defenders for short corner	0	207	43.5%	34.8%	47.6%	49.1%	7.82*	37.5%	46.9%	58.7%	10.45**
	1 to 2	268	56.3%	65.2%	52.4%	50.9%		62.5%	53.1%	41.3%	
	3 to 4	1	0.2%								
Number of intervening attackers	0 to 2	177	37.2%	92.1%	90.8%	94.3%	1.21	81.9%	91.4%	95.2%	12.64**
	1 to 2	261	54.8%								
	3 to 4	36	7.6%	7.9%	9.2%	5.7%		18.1%	8.6%	4.8%	
	5+	2	0.4%								
Number of defenders on posts	Front post	243	51.0%	50.0%	48.5%	57.6%	4.08	48.6%	48.8%	66.7%	44.73**
	Back post	7	1.5%	1.2%	1.9%	0.9%		1.6%	0.6%	3.2%	
	Both posts	68	14.3%	12.8%	15.1%	15.1%		7.6%	26.5%	9.5%	
	No posts	158	33.2%	36.0%	34.5%	26.4%		42.2%	24.1%	20.6%	
Offensive organisation	Static	185	38.9%	33.5%	39.8%	45.3%	3.87	30.7%	45.1%	55.6%	17.09**
	Dynamic	291	61.1%	66.5%	60.2%	54.7%		69.3%	54.9%	44.4%	
Type of marking	Player-to-player	149	31.3%	33.5%	39.8%	11.3%	36.06**	27.5%	37.6%	30.2%	7.52
	Zonal	122	25.6%	21.4%	19.9%	43.4%		24.3%	27.2%	27.0%	
	Mixed	205	43.1%	45.1%	40.3%	45.3%		48.2%	35.2%	42.8%	

* $p < 0.05$, ** $p < 0.01$.

Table 5. Corner kick outcomes in relation to match status and team quality.

	Match Status				Team Quality			
Corner Outcome	Winning	Drawing	Losing	χ2	High	Medium	Low	χ2
	%	%	%		%	%	%	
Total corners	34.4%	43.3%	22.3%		52.7%	34.0%	13.3%	
Goal	4.9%	3.9%	0.9%	3.00	4.8%	1.9%	3.2%	2.49
Shot on-target	17.1%	20.9%	20.8%	0.97	18.7%	22.2%	15.9%	1.39
Shot off-target	25.0%	23.3%	25.5%	0.23	24.3%	22.8%	28.6%	0.81
Clearance/punch – defence/GK	31.7%	36.9%	22.0%	1.10	35.1%	34.6%	31.7%	0.25
Goalkeeper catch	6.1%	4.9%	9.4%	2.50	5.6%	5.6%	11.1%	2.84
Free kick	7.3%	2.4%	2.8%	6.17	3.2%	6.2%	3.2%	2.37
Attacking error	7.9%	7.8%	6.6%	0.18	8.4%	6.8%	6.3%	0.50

* $p < 0.05$, ** $p < 0.01$.

Analysing the influence of corner kick characteristic variables on success when classified as scoring a goal, Table 6 shows that goals were significantly associated with defenders for short corners (χ^2 1 = 4.790, p = 0.029, V = 0.100) and offensive organisation (χ^2 1 = 5.450, p = 0.020, V = 0.107), although the strength of these effect sizes was small. Goals were more likely to occur when there were 1–4 defenders for short corner (5.2%) than when there were no defenders for short corner (1.4%). Goals were also more likely to occur when a dynamic attack was used (5.2%), whereas only 1.1% of corners where static attacks were used produced goals.

4. Discussion

The aims of this study were to describe how corner kicks were taken by women's international football teams during the 2019 FIFA Women's World Cup, to examine the effect of current match status and team quality on corner characteristics and corner outcomes, and to identify corner characteristics associated with shots on-target and goals from corners. The main findings of the current study were that four corner characteristics were significantly associated with match status, and nine corner characteristics were significantly associated with team quality. Three corner characteristics were significantly associated with shots on-target from corners, and two corner characteristics were significantly associated with goals from corners. However, neither match status nor team quality were significantly associated with corner outcomes. Therefore, despite the significant association between some corner characteristics and team quality, higher-quality teams do not always favour corner characteristics which are associated with increased success (goals or shots on-target) as may be expected.

Overall, 476 corners taken during 52 matches were analysed in the current study, which resulted in a mean of 9.2 corners per match. This conforms with previous research in men and women's football reporting a mean of 10 corners per match (Beare & Stone, 2019; Casal et al., 2015; Sainz De Baranda & Lopez-Riquelme, 2012; Siegle & Lames, 2012). There were 17 goals scored from the 476 analysed corners taken during the tournament (including one from a penalty during a corner play and one directly from a corner). With 3.6% of corners in the current study resulting in a goal, this percentage coincides with the 2.2% to 4.1% range reported in men's football (Casal et al., 2015; Kubayi & Larkin, 2019; Pulling, 2015; Pulling et al., 2013; Sainz De Baranda & Lopez-

Table 6. Corner kick success analysed by shots on-target (excluding goals) and goals.

Corner characteristics		Shot on-target					Goal				
		Yes		No		χ2	Yes		No		χ2
Category	Variable	N	%	N	%		N	%	N	%	
Total corners		93	19.5%	383	80.5%		17	3.6%	459	96.4%	
Position	Right	54	20.1%	215	79.9%	0.11	12	4.5%	257	5.5%	1.42
	Left	39	18.8%	168	81.2%		5	2.4%	202	97.6%	
Delivery of ball	Direct	83	19.5%	342	80.5%	0.00	16	3.8%	409	96.2%	0.43
	Indirect	10	19.6%	41	80.4%		1	2.0%	50	98.0%	
Type of delivery	In-swinging	50	19.8%	203	80.2%	1.32	8	3.2%	245	96.8%	1.72
	Out-swinging	15	23.8%	48	76.2%		2	3.2%	61	96.8%	
	Driven	20	18.3%	89	81.7%		6	5.5%	103	94.5%	
	Short	8	15.7%	43	84.3%		1	2.0%	50	98.0%	
Kicking foot	Right	49	17.7%	228	82.3%	1.44	9	3.2%	268	96.8%	0.20
	Left	44	22.1%	155	77.9%		8	4.0%	191	96.0%	
Path of ball	Air	85	19.8%	344	80.2%	0.21	14	3.3%	415	96.7%	1.20
	Ground	8	17.0%	39	83.0%		3	6.4%	44	93.6%	
Delivery area	GA1	23	20.9%	87	79.1%	14.96*	4	3.6%	106	96.4%	3.21
	CA1										
	GA2	15	15.2%	84	84.8%		4	4.0%	95	96.0%	
	CA2	19	17.4%	90	82.6%		6	5.5%	103	94.5%	
	GA3	15	25.0%	45	75.0%		1	1.7%	59	98.3%	
	CA3										
	Front zone	20	31.7%	43	68.3%		2	3.2%	61	96.8%	
	Back zone										
	Edge zone										
	Did not enter	1	2.9%	34	97.1%		0	0.0%	35	100.0%	
Number of attackers	0 to 1	39	15.9%	207	84.1%	4.40*	7	2.8%	239	97.2%	0.78
	2 to 3										
	4 to 5										
	6 to 7	54	23.5%	176	76.5%		10	4.3%	220	95.7%	
	8+										
Number of defenders	2 to 3	12	14.8%	69	85.2%	1.39	4	4.9%	77	95.1%	0.53
	4 to 5										
	6 to 7										
	8+	81	20.5%	314	79.5%		13	3.3%	382	96.7%	
Interaction context	Inferiority	93	19.7%	380	80.3%	0.73	17	3.6%	456	96.4%	0.11
	Equality	0	0.0%	3	100.0%		0	0.0%	3	100.0%	
Attackers for short corner	0	56	21.8%	201	78.2%	1.80	7	2.7%	250	97.3%	1.17
	1 to 2	37	16.9%	182	83.1%		10	4.6%	209	95.4%	
	3 to 4										
Defenders for short corner	0	41	19.8%	166	80.2%	0.02	3	1.4%	204	98.6%	4.79*
	1 to 2	52	19.3%	217	80.7%		14	5.2%	255	94.8%	
	3 to 4										
Number of intervening attackers	0 to 2	78	17.8%	360	82.2%	10.44**	16	3.7%	422	96.3%	0.11
	3 to 4	15	39.5%	23	60.5%		1	2.6%	37	97.4%	
	5+										
Number of defenders on posts	Front post	44	18.1%	199	81.9%	3.01	13	5.3%	230	94.7%	5.51
	Back post	3	42.9%	4	57.1%		0	0.0%	7	100.0%	
	Both posts	15	22.1%	53	77.9%		0	0.0%	68	100.0%	
	No posts	31	19.6%	127	80.4%		4	2.5%	154	97.5%	
Offensive organisation	Static	35	18.9%	150	81.1%	0.07	2	1.1%	183	98.9%	5.45*
	Dynamic	58	19.9%	233	80.1%		15	5.2%	276	94.8%	
Type of marking	Player-to-player	29	19.5%	120	80.5%	2.18	5	3.4%	144	96.6%	2.36
	Zonal	29	23.8%	93	76.2%		2	1.6%	120	98.4%	
	Mixed	35	17.1%	170	82.9%		10	4.9%	195	95.1%	

* $p < 0.05$, ** $p < 0.01$.

Riquelme, 2012). However, this result is still less than the 4.6% of corners resulting in goals reported for the FA Women's Super League (Beare & Stone, 2019). Therefore, it

may be more difficult to produce goals from corners during international tournaments, supporting the trend identified by Kubayi and Larkin (2019). Interestingly, 19.5% of corners resulted in a shot on-target within the current study, whereas only 9.8% of corners resulted in a shot on-target at the 2010 FMWC, UEFA Euro 2012 and UEFA Champions League 2010–2011 (Casal et al., 2015), suggesting men's football is less effective at producing shots on-target from corners.

When acknowledging the associations between match status and corner characteristics, similar to Sainz De Baranda and Lopez-Riquelme (2012), defending teams were more likely to use zonal marking when the corner-taking team was losing. The advantage of zonal marking is that the defence tends to keep their shape and not be pulled out of position if each defender is responsible for a specific zone (Pulling et al., 2013). This reduces the decision-making of the defenders, allowing them to focus on clearing the ball out of the penalty area and away from danger to maintain their lead (Pulling et al., 2013). However, zonal marking may cause uncertainty in defenders if the ball lands between two designated zones (Kubayi & Larkin, 2019; Pulling et al., 2013). This may explain why overall zonal marking occurred least frequently as teams may be more reluctant to use this type of marking; whereas, mixed marking was implemented most frequently, agreeing with previous research (Casal et al., 2015; Kubayi & Larkin, 2019; Sainz De Baranda & Lopez-Riquelme, 2012; Strafford et al., 2019).

When the corner-taking team was drawing or losing, the defending team favoured positioning ≥8 defenders inside the delivery area. This strategy aims to increase the likelihood of defensive outcomes to defend their lead/drawing position (Casal et al., 2017). When the corner-taking team was winning, the defending team preferred positioning 0 to 7 defenders inside the delivery area. Corners can lead to goal-scoring opportunities for the defending team so teams position more players further up the pitch to launch counterattacks in an attempt to equalise (Casal et al., 2017). Alternatively, when the corner-taking team was winning they preferred positioning attackers for short corners, provoking defenders to mark these attackers, increasing the defenders for short corners but reducing the number of defenders inside the delivery area. The corner-taking team favoured positioning zero attackers for short corners when losing (68.9%), with the defending team also preferring to not position defenders for short corners when the corner-taking team was drawing or losing (47.6% and 49.1% respectively). These results suggest that the defending team tends to react to the corner-taking team by positioning players in the same areas of the pitch to reduce corner effectiveness.

Despite there being no significant association between team quality and corner outcomes, team quality was significantly associated with several corner characteristics. High-quality teams favoured indirect corners (13.5%), plus driven deliveries (29.1%) and short corners (13.1%). Short corners influence the defending team's organisational structure as defenders must focus on the ball plus follow the attackers for short corner (Casal et al., 2015). When defending against short corners, the defending team is advised to send two defenders for the short corner to initiate a 2v2 with the corner-taker and attacker for short corner (Parker, 2008). Defenders for short corners were more frequent (56.5% of corners) than attackers for short corner (46.0%), suggesting that defending teams were aware of the threat of short corners so positioned defenders for short corners more frequently out of caution, especially if playing against high-quality teams who use short

corners more often and were more likely to position attackers for short corners. However, in agreement with findings from men and women's football, short corners occurred least frequently (Beare & Stone, 2019; Kubayi & Larkin, 2019; Sainz De Baranda & Lopez-Riquelme, 2012), perhaps alluding to their potential use of surprising the opposition.

Most corners in the current study were in-swinging (53.2%), potentially because when the ball curves towards the goal during in-swinging corners it pressures the defenders and goalkeeper to clear the ball away to prevent the opposition scoring (Kubayi & Larkin, 2019). This may explain why during the 2018 FMWC most goals were conceded from in-swinging corners (Kubayi & Larkin, 2019). However, high-quality teams were less likely to use in-swinging deliveries (45.4%) than medium-quality teams (68.5%). High percentages of goalkeeper catches and punches occur in GA2, as this is where the goalkeeper is usually located (Pulling, 2015). In the current study, two thirds of all 30 goalkeeper catches from corners occurred in GA2, agreeing with these previous findings. Additionally, a smaller percentage of goals were scored when corners were delivered to GA2 in the current study (4.0%) when compared to findings from the FA Women's Super League 2017/2018 (13.0%); whereas, a greater percentage of shots on-target were conceded from corners delivered to GA2 in the current study (15.2%) when compared to findings from the FA Women's Super League 2017/2018 (7.0%) (Beare & Stone, 2019). This could indicate that international goalkeepers may be more effective than domestic league goalkeepers as they save more shots from corners delivered to GA2.

Alternatively, out-swinging deliveries curve away from the goalkeeper and towards the oncoming attackers, limiting the goalkeeper's ability to intercept the ball (Kubayi & Larkin, 2019; Pulling et al., 2018). Therefore, high-quality teams may be less inclined to use in-swinging corners and favour alternative types of delivery to avoid goalkeeper catches. However, type of delivery was not significantly associated with shots on-target or goals in the current study.

High-quality and medium-quality teams favoured dynamic attacks, whereas low-quality teams favoured static attacks. This finding is in partial agreement with Strafford et al. (2019) who found that the top six teams of the EPL 2015–2016 preferred dynamic attacks, although their bottom six teams used dynamic and static attacks equally. Dynamic attacks enable the attackers to escape the marking of the defenders and play passes for teammates to run on to or take shots at goal (Strafford et al., 2019). Alternatively, static attacks allow the corner-taker to deliver the ball to specific teammates or zones more easily, which is beneficial for low-quality teams who used in-swinging deliveries most frequently (Strafford et al., 2019).

Goals from corners were significantly associated with offensive organisation, coinciding with previous research investigating men's football (Casal et al., 2015; Strafford et al., 2019). Dynamic attacks occurred more frequently than static attacks in the current study, whereas the opposite was observed in men and domestic women's football (Beare & Stone, 2019; Casal et al., 2015; Strafford et al., 2019). Nevertheless, goals were more likely to occur after dynamic attacks (5.2%) as opposed to static attacks (1.1%), agreeing with findings from both men and women's football (Beare & Stone, 2019; Casal et al., 2015; Strafford et al., 2019). This potentially explains why high- and medium-quality teams favoured using dynamic attacks. However, no significant associations were reported between offensive organisation and shots on-target or goals during the FA Women's

Super League 2017–2018 (Beare & Stone, 2019). This demonstrates a difference between women's domestic and international football, and a similarity between men's and international women's football.

Goals were significantly associated with defenders for short corners and were more likely to occur with 1–4 defenders for short corners (5.2%) than with zero defenders for short corners (1.4%). As previously mentioned, teams are advised to have defenders marking attackers for short corners to defend against short corners (Parker, 2008). The current study observed that defenders for short corners were more frequent than attackers for short corners to deter short corners. However, short corners resulted in the fewest number of goals, whereas direct corners had greater success. Furthermore, the corner-taking team may use attackers for short corners as decoys to reduce the number of defenders in the delivery area, increasing the space for attackers. As goals occurred more frequently when there were defenders for short corners, advice surrounding short corners may need to be reviewed to suggest teams should prioritise defending the delivery area in international women's football.

Shots on-target (excluding goals) from corners were significantly associated with the delivery area. Overall, 22.9% of corners were delivered to CA2 and 20.8% of corners were delivered to GA2. However, the current study observed that corners resulted in shots on-target (excluding goals) more frequently when delivered into GA1&CA1 (20.9%), GA3&CA3 (25.0%) and the outer zones (31.7%), and occurred less frequently when corners were delivered to GA2, (15.2%) and CA2 (17.4%). Thereby perhaps suggesting that all the teams within the current study, as there was no association between delivery area and team quality, were targeting less efficient delivery areas. However, these findings disagree with Beare and Stone (2019) who reported that shots on-target occurred most frequently when corners were delivered to CA2 (14.7%), whereas shots on-target were least likely to occur in the combined GA1&CA1 zone (4.8%).

Shots on-target were more likely to occur when ≥6 attackers were inside the delivery area (23.5%) when compared to 0–5 attackers (15.9%). In agreement with Casal et al. (2015), the likelihood of a shot on-target also increased as the number of intervening attackers increased. Both the current study and Casal et al. (2015) reported that 1–2 intervening attackers occurred most frequently (54.8% and 88.8% respectively). However, shots on-target were more likely when ≥3 intervening attackers in the current study (39.5%) and 3–4 intervening attackers in Casal et al.'s (2015) study were utilised. This may explain why high-quality teams were significantly more likely to use ≥3 intervening attackers.

No significant associations were observed between team quality and corner outcomes. Therefore, despite the corners taken by high-quality teams displaying different characteristics, they were not more likely to result in a goal or shot on-target than medium- or low-quality teams. For example, high-quality teams favoured using ≥ 3 intervening attackers which is more likely to result in a shot on-target, but high-quality teams also favoured positioning 0–5 attackers inside the delivery area which was associated with a reduced likelihood of a shot on-target, so tending to adopt a less successful corner attacking set-up when success is defined by the corner resulting in a shot on-target or goal. No significant associations were found within the current study between match status and corner outcomes, which is in agreement with Sainz De Baranda and Lopez-Riquelme (2012) for men's football. Therefore, despite the corners taken by teams when

winning displaying different characteristics, they were not more likely to result in a shot on-target or goal than teams when drawing or losing. However, this does not necessarily mean the corners are not effective as winning teams may utilise short corners late in the match to keep the ball near the corner flag to run down the clock. This could be one possible explanation why there were no significant associations between match status and corner outcomes.

Overall, the current study demonstrated that four corner characteristics were significantly associated with match status, and nine corner characteristics were significantly associated with team quality. These findings are for group mean data and therefore may not represent individual team characteristics from within the different team quality categories. Furthermore, three out of the four corner characteristics associated with match status were also associated with team quality, which suggests that there could be an interaction between match status and team quality as it could be assumed that high-quality teams will be winning more frequently than low-quality teams. Additionally, the competition stage of the tournament, i.e. group or knockout stage, quality of the opposition and goal difference during the match could influence corner outcomes. In addition, corners from only one tournament were analysed in the current study. Therefore, some caution must be taken when interpreting the results of the current study and it should be considered as a preliminary investigation into this area. Further analysis, with a larger data set by collating corner data from multiple tournaments (Casal et al., 2015), should consider a more holistic approach by examining the interaction between match status and team quality plus the influence of other contextual variables that may influence corner characteristics.

5. Conclusion

In conclusion, the current study examined the corner kicks taken during the FIFA women's World Cup 2019, demonstrating that offensive organisation and defenders for short corners were significantly associated with goals from corners. The significant association between match status and corner characteristics can help coaches understand corner characteristics to expect when winning, drawing or losing within women's international football. The significant associations between team quality and corner characteristics can assist coaches to identify corner characteristics they may be more likely to encounter when playing against different levels of opposition within women's international football. Additionally, teams should utilise dynamic attacks, deliver the ball to GA1&CA1, GA3&CA3 and the outer zones, use ≥6 attackers, or use ≥3 intervening attackers to improve the success of their teams' corners within women's international football. Despite there being significant associations between team quality and corner characteristics, team quality was not significantly associated with corner kick outcomes, perhaps a consequence of high-quality teams not always favouring characteristics that were significantly associated with more successful corners when success is defined as a corner resulting in a goal or shot on-target. Future research should continue to explore corners within women's international football by investigating the potential influence of other contextual variables that may influence corner characteristics and corner outcomes.

Conflicts of interest

No potential conflict of interest was reported by the author(s).

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