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The relationships between tactical formation, technical-tactical performance, and match outcome in the Ethiopian Bet King Premier League

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ABSTRACT

This study aimed to conduct a comprehensive analysis using a correlational study design to find the relationships between tactical formation, technical-tactical performance, and match outcome in the Ethiopian Bet King Premier League. Out of the seasons 240 matches, 40 matches were taken using a purposive sampling technique. A conceptual model guided the study process and how the study variables relate to one another, illuminating the dynamics that affect success in competitive soccer situations. The study results showed that in the Ethiopian Bet King Premier League, formation does not correlate with either technical-tactical performances such as ball possession and shots or with match outcomes, except the interrelationship among the technical tactical performance parameters and match outcome. However, a significant difference exists among the formations only in possession percentage $F (3, 76) = 3.018$, $p = .035$. The study has the implication that investigation of key performance indicators (KPIs) in today's soccer must go far beyond identifying advanced performance indicators that can reflect the outcome of the game. Thus, for coaching, it implies that what matters the most is not the position we give to each player and the number of players in each position; instead, the complex intricacies of players' movement, decisions, and positional change among the players could be potential factors for winning/match outcome.

KEYWORDS

Formation; Technical-Tactical; Performance Indicator; Match Outcome

1. INTRODUCTION

Soccer with its popularity and media coverage has an immense economic impact. This situation has posed a good deal of pressure on clubs, players, coaches, and managers with the ultimate of increasing performance and success. Regardless of the nation's football status and the level of competition, match outcome is the biggest concern, business, and claim (Sousa et al., 2024). Because the business and recognition a team can earn are highly tied to winning (match outcome). As a result, clubs that run multi-million dollars and those with relatively smaller business firms are both going and dying hard to alter match outcomes. In today's highly commercialized and politicized football, regardless of performance potential and level, football teams, club owners, fans, and administrators are highly worried about match outcomes.

Match outcomes in the contemporary soccer are the main determinants of big decisions regarding club ownership, player selling/buying, and most importantly hiring, extending or terminating contracts to fire coaches (Nissen, 2016; van Ours & van Tuijl, 2016). As a result, coaches are highly and critically engaged in devising training, recruiting players, and most notably the way to play each phase and sub-phases of a match. The evolving nature of the game at each sub-phase level can adequately witness that the coaches are always researching on the matter and affecting how the game could be played in favor of the outcome (Lacome et al., 2018; Sarmento et al., 2014). Thus, formation in football at a tactical level is in due consideration of match outcomes. It was such a huge and in most cases a debating agenda of coaches and media. The matter of formation is a hot issue as match performance analysis experts and coaching staff, veteran players and coaches, sports journalists, and performance analysts discuss formation against success and performance (Aquino et al., 2017, 2020). Match outcomes such as winning, draw, and losing are the results of numerous factors.

Tactical formation operationally refers to the positioning of players on the field and the overall structure adopted by a team during a match. Different formations, such as 4-4-2, 4-3-3, 4-2-3-1, 4-1-4-1 or 3-5-2, offer different strategic advantages and prioritize various aspects of play, such as low or mid-defensive block, midfield control, central/wide attacking or attacking potency. Coaches often select a formation based on the style of play and personnel. The effectiveness of a team`s formation can heavily influence its ability to control the game, create scoring opportunities, and defend against the opponent`s attacks ((Aquino et al., 2020; Vieiraet al., 2018).

Technical-tactical performance refers to how well players execute the tactics and strategies set by the coach during the match. This includes elements such as pass completion, controlled possession, positional play, decision accuracy and defensive organization and performance (Amatria et al., 2019).

Teams with superior technical-tactical performance are often more successful in implementing their game plan, dominating possession, creating goal-scoring opportunities, and preventing the opponent from scoring (Soroka et al., 2023).

Performance level in terms of physical and technical-tactical action is believed to determine match outcome as a high-performance team with these parameters is highly likely to be the winning team (Goral, 2015; Kempe et al., 2014; Lepschy et al., 2020; Liu et al., 2021). Some of the factors as total distance coverage during the match and high-intensity running(Hoppe et al., 2015), though their match-outcome determination capacity is in doubt in higher-level football (Di Salvo et al., 2009; Díez et al., 2021; Hoppe et al., 2015; Lepschy et al., 2020; Rampinini et al., 2009) are commonly taken as determinants of match-outcome. But those technical-tactical performance parameters such as possession, total number of passes, passing effectiveness, shots, and on-target shots are significant match-outcome predictors (Díez et al., 2021; Goral, 2015; Kempe et al., 2014).

In addition, distance per possession (Hoppe et al., 2015) and possession around opponents' box are found to be significant success predictors (Brito et al., 2019; Casal et al., 2019; Díez et al., 2021). Generally, most of those key technical-tactical performance parameters are match-outcome predictors. To this end, coaches highly rely on their training, ideas, and game–models or principles and formation on the focus of dominating their opponent on those technical-tactical performance indicators (Brito de Souza et al., 2019; Díez et al., 2021). Thus, they aim to dominate possession, ensuring accurate passes, circulating the ball, and creating and exploiting goal-scoring chances (Lepschy et al., 2020).

Soccer is a dynamic sport where outcomes in games are mostly determined by tactical capability (Amatria et al., 2019; Casal et al., 2019). While players` technical-tactical skill and how they are used in the context of a match greatly impact the success of tactical formations, they nonetheless function as a guide for on-field organization. Tactical formation and technical-tactical performance play significant roles in determining match outcomes in soccer at both national and international levels.

Studying the relationship between tactical formation, technical-tactical performance, and match outcomes in soccer at national club competitions is crucial for understanding the dynamics of the game and identifying factors that contribute to success. Even coaches select and position players based on these key performance indicators. However, the relationship between tactical formation, technical-tactical performance, and match outcome is not studied adequately and well-established (Rein & Memmert, 2016). Complicating the matter, teams with the same kind of formation do not have similar levels of technical-tactical performance score and success level. Thus, the matter deems detailed

context-specific explanation and scientific investigation. For instance, in the Spanish second division, it is demonstrated that playing formations influence physical demands and the technical-tactical actions of the players (Arjol-Serrano et al., 2021). In the same way, at the Brazilian 1st to 4th league level, the relationship of formation with total distance coverage, high-intensity running, and technical-tactical performance score is studied with the implication for training and game model development (Aquino et al., 2017).

There is an increased interest in understanding the relationship between tactical formation, technical-tactical performance, and match outcome, however studies examining these relationships remain scarce, especially in the context of sub-Saharan soccer, It is clear that , there is not enough and conclusive empirical evidence on the matter in Africa, more specifically in Ethiopian premier league football regarding the potential relationship between tactical formation, technical-tactical performances, and match outcome. Primarily because the key performance indicators have not been specifically and contextually studied so far.

For Ethiopian football to be scaled up and coaches to have a better understanding of the specific contextual knowledge for training and success, the matter has to be clarified. The purpose of this study is to examine the relationships between tactical formation, technical-tactical performance, and match outcome in the context of Ethiopian Bet King Premier League soccer clubs, shedding light on the dynamics that influence success in competitive soccer environments. More specifically, this study is conducted to answer the following research questions:

1. Does football formation relate to tactical performance parameters in Ethiopian bet king premier league?
2. How does the adoption of different tactical formations affect teams' technical-tactical performance and match outcomes in Ethiopian bet king premier league?
3. Which aspects of technical-tactical performance are most strongly correlated with match outcomes, and how do these vary across different formations?
4. To what extent do variations in tactical formation during a match impact teams' technical-tactical performance and their ability to achieve favorable match outcomes in Ethiopian bet king premier league?
5. What are the relative contributions of tactical formation and technical-tactical performance factors to predicting match outcomes in Ethiopian bet king premier league?

The relationship between tactical formation, technical-tactical performance, and match outcome in national soccer is a complex and multifaceted subject that emerges from the nature and use of these variables and how we measure them. Tactical formation and technical-tactical performance play significant roles in determining match outcomes in soccer at both national and international levels (Amatria et al., 2019; Brito de Souza et al., 2019; Casal et al., 2019; Memmert et al., 2019). Both tactical formation and technical-tactical performance interact to shape the outcome of a match (reference). Studies show that a team with a well-suited formation and high technical-tactical proficiency is more likely to control the game, dictate the pace, and ultimately secure a positive outcome (Aquino et al., 2017; Memmert et al., 2019). Hence, tactical formation and technical-tactical performance significantly influence match outcomes.

- *H1. Teams with greater tactical knowledge and ability to execute their strategy will probably control the game and dictate the flow of the match, which will increase their chances of winning.*

The choice of tactical formation directly impacts a team's approach to the match and can influence technical-tactical performance. For example, a defensively oriented formation like 5-3-2 might prioritize solidity at the back and counter-attacking opportunities, while a possession-based formation like 4-3-3 aims to dominate midfield and control the game (Aquino et al., 2017; Memmert et al., 2019). Therefore, technical-tactical performance within a chosen formation determines how effectively a team can implement its strategy on the field.

- *H2. Teams with better technical abilities and tactical cohesion are more likely to execute their game plan successfully and influence the outcome in their favor.*

Ultimately, the combination of tactical formation and technical-tactical performance significantly influences the match outcome.

- *H3. Teams that effectively utilize their chosen formation and excel in executing their tactics have a higher probability of achieving a positive result, whether it be a win, draw, or even minimizing losses in challenging matchups.*

In general, the relationship between tactical formation, technical-tactical performance, and match outcome in national soccer is dynamic and interdependent. Teams must carefully balance their tactical approach, technical abilities, and in-game execution to maximize their chances of success on the field.

It is essential to study the relationships between tactical formation, technical-tactical performance, and match outcomes in soccer in national club championships for several reasons. Analyzing these relationships yields insightful information that can improve player development, team management, and strategic decision-making, all of which can lead to better performance and success in national club championships.

For instance, coaches and teams can create efficient strategic plans by knowing how various tactical formations impact technical-tactical performance and match outcomes. Teams can adjust their strategies to increase their chances of winning by researching which formations perform best against particular opponents or under particular circumstances. Also, analyzing the relationship between tactical formations and performance helps in identifying the strengths and weaknesses of players within different formations. This insight can be used to tailor training programs to improve players' skills and adaptability to different tactical approaches.

Small tactical advantages can make a big impact in highly competitive contexts like national club competitions. Teams can obtain insights that provide them with a competitive advantage over their rivals by examining these relationships. Teams can modify their plans to improve overall performance by knowing how tactical formations affect technical-tactical performance. To best play to the team's strengths and take advantage of the vulnerabilities of opponents, this may entail changing formations, player positions, or playing styles.

This study aims to conduct a comprehensive analysis using a correlational study design to find the relationships between tactical formation, technical-tactical performance, and match outcome in the Ethiopian Bet King Premier League.

2. METHODS

A correlational design was used as per the objective of the study. The potential association between the common tactical formations such as 4-3-3, 4-2-3-1, 4-4-2 and 4-1-4-1 with technical tactical performance parameters and match outcome was examined using zero-order correlation method. This correlational design allowed the authors to observe the three naturally occurring variables measured in their natural environment. This means the authors examined real matches and their outcomes as they happen without intervening or manipulating variables. This is important because manipulating variables in a sport like soccer can be difficult and may not reflect real-world scenarios accurately.

The study was about Ethiopian bet king premier league participating teams in the 2022/23 season competition. Data were collected from a representative sample of matches across the 2022/23 seasons in the Ethiopian bet king premier league. 40 matches were taken using a purposive sampling technique. This is because when more than one formation is used within a match, the match was excluded from further analysis. In addition, when there is a red card or when a team is at a numerical disadvantage, the match has been excluded. The data was obtained from the data center of super sport live stream game analysis.

In this study, the authors used a correlational study design, combining analysis of match data with qualitative assessments of tactical formations and technical-tactical performances. Figure 1 presents the study variables and their components.

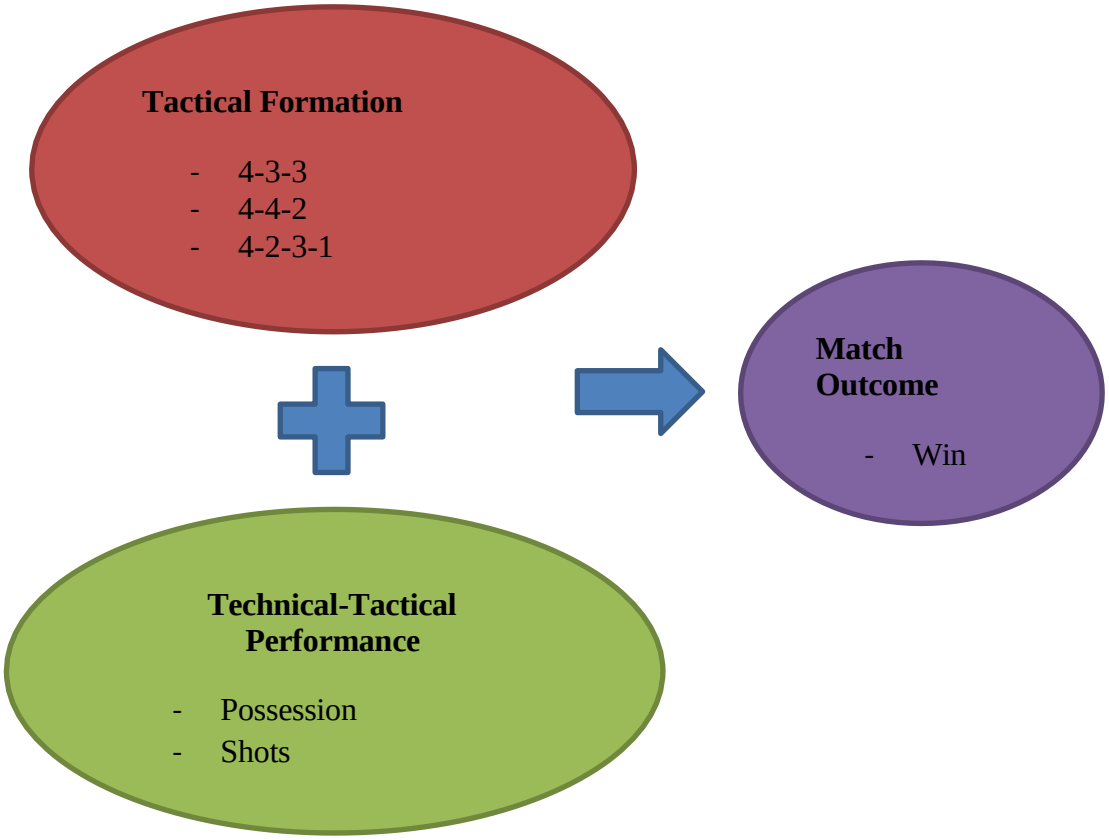

Figure 1. The conceptual model of the study

In figure 1 tactical formation are identified and classified based on established conventions, while technical-tactical performance metrics such as passing completion, ball possession percentage, shots on goal and goals scored/conceded are carefully recorded. Match outcomes are categorized into wins, draws and losses for each team are considered. Based on the conceptual model, the study has

considered tactical formation as a moderator for technical-tactical performance and implying for the final match outcomes of win, draw or lose.

Regarding statistical analysis, bivariate correlation was used to test the relationship that formation has with technical and tactical performance parameters. The association between formation and match outcome was also tested using bivariate correlation of Pearson moment correlation. To critically articulate the relationships among tactical formation, technical-tactical performance score and match outcome descriptive statistics such as mean, standard deviation, minimum and maximum and additional inferential statistics like ANOVA has been used.

3. RESULTS

The study was aimed at identifying the potential relationship among tactical formation, technical-tactical performance and match outcome. To test the relationship, the common tactical formations such as 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 were considered. Technical-tactical performance was considered in terms of ball possession percentage, total shots made, on-target shots, goals scored and goals conceded. Match out-come has also been analyzed by having three pints for win, one point for draw and zero for lose. To this end, correlational analysis and ANOVA in addition to the descriptive statistics has been used. The descriptive summary presents all of the study variables such as ball possession percentage, total shots, on-target shots, goals scored, and goals conceded.

The average ball possession of Ethiopian bet king premier league teams with the common playing formations of 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 ranges between 44.12 and 51.03% (table 1). Thus, the minimum ball possession ability of teams was 44.12% with 4-4-2 formation and the maximum was 51.03% with 4-3-3 formation (table 1). Noticing this variability in ball possession among the different formations, ANOVA test was carried out to examine whether there is a significant ball possession difference among the formations in question. Table 3 presents the ANOVA summary results.

On target shots in Ethiopian premier league football among the common playing formations ranges between 3.25 and 4.58 per 90 minutes (table 1). As per the descriptive statistics, the maximum on target shot is from the 4-3-3 formation while the minimum on target shot is obtained from the 4-4-2 formation. As an offensive technical tactical performance, the average goal scoring probability of Ethiopian bet king premier league with the different formations such as 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 is 0.75, 1.31, 0.84, 0.62 and 1.11 respectively (table 1). The standard deviation is also small which ranges from 0.74-1.37. The average goal scoring probability of Ethiopian bet king premier league with

the different formations such as 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 was 0.75, 1.31, 0.84, 0.62 and 1.11 respectively (table 1). The standard deviation is also small which ranges from 0.74-1.37. The range of goals conceded in Ethiopian bet king premier league football with the different formations ranges between 0.5 and 1.6 per match. Following the descriptive analysis, correlation and one way ANOVA test were used to test whether the difference in on-target shots, goals scored and conceded is statistically significant across the formations.

Table 1. Descriptive statistics of technical tactical performances and match outcome across the formations

						95% Confidence Interval for Mean			
		N	Mean	SD	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Ball Possession	4 4 2	8	44.12	4.58	1.61	40.29	47.95	37.00	51.00
	4 3 3	51	51.03	6.91	.96	49.09	52.98	39.00	64.00
	4 2 3 1	13	47.23	7.44	2.06	42.73	51.72	36.00	61.00
	4 1 4 1	8	48.62	7.20	2.54	42.59	54.65	37.00	57.00
	Total	80	49.48	7.10	.79	47.90	51.06	36.00	64.00
Goal Scored	4 4 2	8	.75	1.03	.36	-.11	1.61	.00	2.00
	4 3 3	51	1.31	1.37	.19	.92	1.70	.00	7.00
	4 2 3 1	13	.84	1.06	.29	.20	1.49	.00	3.00
	4 1 4 1	8	.62	.74	.26	.00	1.24	.00	2.00
	Total	80	1.11	1.26	.14	.83	1.39	.00	7.00
Goal Conceded	4 4 2	8	.87	.83	.29	.17	1.57	.00	2.00
	4 3 3	51	1.13	1.26	.17	.78	1.49	.00	7.00
	4 2 3 1	13	1.61	1.32	.36	.81	2.41	.00	5.00
	4 1 4 1	8	.50	.75	.26	-.13	1.13	.00	2.00
	Total	80	1.12	1.21	.13	.85	1.39	.00	7.00
On target Shots	4 4 2	8	3.25	1.03	.36	2.38	4.11	2.00	5.00
	4 3 3	51	4.58	1.67	.23	4.11	5.05	1.00	11.00
	4 2 3 1	13	4.30	1.25	.34	3.55	5.06	3.00	7.00
	4 1 4 1	8	3.62	1.30	.46	2.53	4.71	2.00	6.00
	Total	80	4.31	1.57	.17	3.96	4.66	1.00	11.00
Match outcome	4 4 2	8	1.50	1.30	.46	.40	2.59	.00	3.00
	4 3 3	51	1.37	1.28	.179	1.01	1.73	.00	3.00
	4 2 3 1	13	1.30	1.03	.28	.68	1.93	.00	3.00
	4 1 4 1	8	1.37	1.40	.49	.19	2.55	.00	3.00
	Total	80	1.37	1.23	.138	1.09	1.65	.00	3.00

One of the objectives of the study was to examine how the common formations such as 4-3-3, 4-2-3-1, 4-4-2 and 4-1-4-1 relate with the main technical-tactical performance parameters of

possession, shots, goals scored, and goals conceded in Ethiopian bet king premier league. Tactical formation as it is referred as the arrangement and positioning of players at different lines such as defensive, defensive midfielder, offensive midfielder and forwards including wingers and strikers has no relationship with any of the technical-tactical performance parameters in the Ethiopian bet king premier league (table 2). Thus, either ball possession or the resulting number of shots made has no significant relationship with formation. In the same way, formation in Ethiopian Bet King Premier League football do not significantly relate with the number of goals teams scored and conceded (table 2). When the interrelationship among the technical tactical performance parameters is examined, the only significant relationships that exists are between possession and shots made $r(79) = .320$, $p = .004$ and between on-target shots and goals scored $r(79) = 0.664$, $p < .001$ (table 2). There is no statistically significant correlation among possession, goals scored, and goals conceded (table 2).

Table 2. The relationship between formation and technical tactical performances

Variable		Formation	Possession	Goals scored	Goals conceded	On-target shot
1.Formation	Pearson's r	—				
	p-value	—				
2. Possession	Pearson's r	-.001	—			
	p-value	0.996	—			
3. Goals scored	Pearson's r	-0.108	0.186	—		
	p-value	0.340	0.099	—		
4. Goals conceded	Pearson's r	-0.022	-0.203	0.057	—	
	p-value	0.848	0.070	0.617	—	
5.On-target Shot	Pearson's r	-0.027	0.320	0.664	-0.034	—
	p-value	0.815	0.004	< .001	0.765	—

In Ethiopian Bet King Premier League, only possession of the ball significantly varies among the common formations of 4-4-2, 4-3-3, 4-2-3-1, and 4-1-4-1 $F(3, 76) = 3.01$, $p = .03$. However, there is no a significant difference in on-target shots, goal scoring probability and points obtained per game among the different formations of 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 in Ethiopian bet king premier league (table 3).

Table 3. Technical tactical performance and match outcome across the formations

		Sum of Squares	df	Mean Square	F	*p*
Ball Possession	Between Groups	425.008	3	141.669	3.018	.035
	Within Groups	3566.979	76	46.934		
	Total	3991.987	79			
Goals Scored	Between Groups	5.940	3	1.980	1.253	.296
	Within Groups	120.048	76	1.580		
	Total	125.988	79			
Goals conceded	Between Groups	6.759	3	2.253	1.557	.207
	Within Groups	109.991	76	1.447		
	Total	116.750	79			
On target Shots	Between Groups	16.690	3	5.563	2.369	.077
	Within Groups	178.497	76	2.349		
	Total	195.188	79			
Match outcome	Between Groups	.184	3	.061	.039	.990
	Within Groups	120.566	76	1.586		
	Total	120.750	79			

The only difference ball possession among the different tactical formations is between 4-4-2 and 4-3-3 formation with a mean difference of -6.914, p = .047 (table 4). There is not any other significant difference in ball possession when each formation is compared to one another.

Table 4. Multiple comparisons (ball possession)

(I) formation of the game	(J) formation of the game	Mean Difference (I-J)	Std. Error	*p*	95% Confidence Interval	
					Lower Bound	Upper Bound
4 4 2	4 3 3	-6.914*	2.605	.047	-13.757	-.070
	4 2 3 1	-3.105	3.078	.745	-11.192	4.980
	4 1 4 1	-4.500	3.425	.557	-13.497	4.497
4 3 3	4 4 2	6.914*	2.605	.047	.070	13.757
	4 2 3 1	3.808	2.128	.286	-1.782	9.399
	4 1 4 1	2.414	2.605	.791	-4.429	9.257
4 2 3 1	4 4 2	3.105	3.078	.745	-4.980	11.192

	4 3 3	-3.808	2.128	.286	-9.399	1.782
	4 1 4 1	-1.394	3.078	.969	-9.480	6.692
4 1 4 1	4 4 2	4.500	3.425	.557	-4.497	13.497
	4 3 3	-2.414	2.605	.791	-9.257	4.429
	4 2 3 1	1.394	3.078	.969	-6.692	9.480

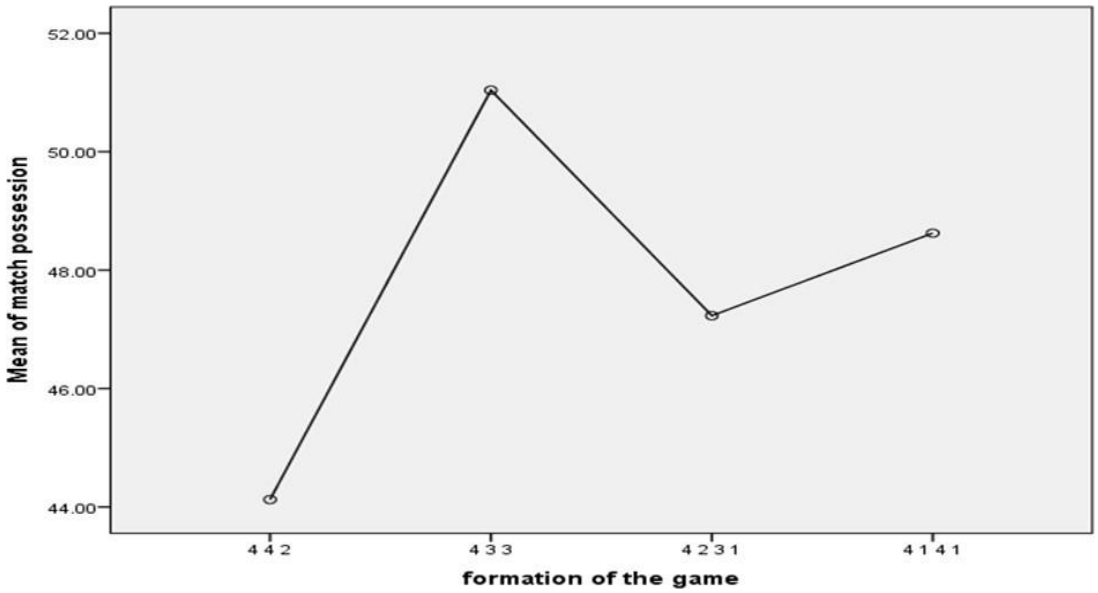

Figure 2. Mean plot possession in the different formation

One of the ultimate of the study was to unveil the relationship between tactical formation and match outcome. When match outcome is considered as the points obtained from a match (i.e., out of 3 points), 1.50, 1.37, 1.30, and 1.37 point was obtained from the formations 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 respectively (table 1). Thus, 4-4-2 tactical formation has enabled the maximum point 1.50 per game and 4-2-3-1 enabled the minimum point of 1.30 per game (table 1). Regardless of the difference in points obtained per match among the different formations, there is not a significant relationship between formation and match outcome (table 5).

Table 5. The relationship between formation and match outcome

		Match outcome
Formation	Pearson Correlation	.025
	Sig. (2-tailed)	.827
	N	80

Match outcome has not a significant relationship with possession. However, on target shot has a statistically significant association with match out come in Ethiopian Bet king Premier league football r (79) = .356, p = .001 (table 6). The number of goals scored by teams has a significant relationship with match outcome r (79) = .540, p<.001. In addition, the number of goals conceded by teams has a significant inverse relationship with match outcome. Therefore, teams with higher on target shots, goals scored, and minimum goals conceded are highly likely to win or earn higher points per match. As the relationship between possession and on target shots is significant (r (79) = .356, p = .001), teams with greater possession and a positive translation of possession into on target shots are likely to achieve a greater match outcome. Mach out-come has a significant inverse relationship with goals conceded r (79) = -.234, p = .037. Indirectly, 4-3-3 as a formation is too likely to help teams to achieve greater ball possession, which can be converted into a positive attack to have greater on target shots which is also helpful to obtain better match outcome in Ethiopian bet king premier league.

Table 6. The relationship between technical tactical performance and match outcome

Variable		Match outcome	Possession	Goals scored	Goals conceded	On target shot
1. Match outcome	Pearson's r	—				
	p-value	—				
2. Possession	Pearson's r	0.153	—			
	p-value	0.175	—			
3. Goal scored	Pearson's r	0.540	0.186	—		
	p-value	< .001	0.099	—		
4. Goal conceded	Pearson's r	-0.234	-0.203	0.057	—	
	p-value	0.037	0.070	0.617	—	
5.On target shot	Pearson's r	0.356	0.320	0.664	-0.034	—
	p-value	0.001	0.004	< .001	0.765	—

4. DISCUSSION

The purpose of the study was to identify how strong is the relationship between the common formations used by Ethiopian premier league clubs with their technical tactical performance profiles such as ball possession, on target shots, goals scored, and goals conceded. From the study, it was found that in Ethiopian bet king premier league, formation has not a significant relationship with the most common technical tactical performance parameters such as ball possession, on target shots, goals scored, and goals conceded. In most competitive soccer, the ability of these technical tactical

performance parameters to predict match outcome or success is significant. And as a result, coaches have specific formation to take the dominancy in those success predictors and to achieve success or earn greater points per matches. Parallel to this claim, Aquino et al. (2017) and Arjol-Serrano et al. (2021) found that formation has such a significant relationship with technical tactical performance scores.

To a prominent level, a slight change in formation or structure is responsible for bringing substantial changes in some key match outcome predictor parameters. A study in the Bundesliga indicated that a change from 4-4-2 flat into 4-4-2 diamond shape resulted in a greater change in the number of passes made into the attacking zone and passes made within the attacking zone (Memmert et al., 2019). However, the study by (Memmert et al., 2019) was done on a single team across different formations, which was not the case in this study. The unique result of this study in terms of the association between formation and key technical-tactical performance indicators might account to the reason that the different formations were not considered over the same teams. Instead, the different teams which employed different formations were considered which can be affected by the general styles of defending and attacking adapted by the teams. Moreover, the disparity of the findings might be due to the smaller number of matches considered as large samples can help to minimize the distortions by some matches which might be out of luck and rare results. In addition, in some other advanced performance measures such as effective playing space and space control gain has been shown to not be associated with formation (Memmert et al., 2019; Rein & Memmert, 2016).

In modern soccer, the performance level regarding the physical exertion and the technical tactical actions can be affected by the opponents. The technical-tactical performance parameters can greatly be affected by the opposition formation as well as the opposition team quality (Carling, 2011). However, in this study, the opposition's team formation and quality were not considered as a factor and as well it was not controlled when the relationship between formation and technical-tactical performance was tested. This might be one contributing factor for the relationships between formation and technical-tactical performance to be non-significant.

The other research question addressed in this study was to unveil the relationship between tactical formation and match outcome. Per 90 minutes match, the studied formations in the Ethiopian bet king premier league such as the 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1 enabled to earn 1.50, 1.37, 1.30, and 1.37 points respectively (table 1). Thus, 4-4-2 tactical formation has enabled the maximum point of 1.50 per game and 4-2-3-1 enabled the minimum point of 1.30 per game (table 1). Regardless of the difference in points obtained per match among the different formations, there was not a significant

relationship between formation and match outcome (table 5). However, there are factors which can potentially moderate the relationship between formation and technical tactical performances. For example, with the same formation playing at home and away can greatly impact the score in the parameters (Aquino et al., 2018). Even the time of the season can alter the relationship between those technical tactical performance indicators such as shots and crosses and thus resultant goals to be scored with formation (Errekagorri et al., 2023). In some instances, the opponent's formation as a factor might significantly affect the technical tactical performance of a specific formation (Vieira et al., 2018). Contributing to the result obtained, none of these potential moderating factors has been controlled in the study. Further studies on the matter need better be in consideration and in control of all these potential moderating factors.

Formation has an effect (relationship) on match technical performance at a team and position level (Forcher et al., 2022). However, on a team level, smaller differences were observed for formations that are similar in the number of players in each playing position (i.e. 4-5-1, 4-2-3-1). Thus, the finding of non-significant difference among the formations in Ethiopian bet king premier league can be accounted to the approximate similarity in the number of players in each position. The number of players in each position might not be that big among 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1

As a matter of practical evidence, teams with 4-3-3 formation on paper and at the start of the match will have 3-2-2-3 or 3-1-6 kind of formation or shape when they have possession. This is too common to observe in big European clubs. Thus, a mere consideration of starting formation/line-up could not be easily associated with any key performance indicator of ball, possession or shots and chances created. The other issue in this regard might be that formation is becoming weird as the movement and momentary positional and shape changes can still be responsible for. The other potential moderating factor might be that with a specific kind of formation, the role given to each position player and the guiding principles regarding the movement to be made might be too different based on the style of play the team has and principles tied with the game model.

Recently as the method and technology advances, big data with every aspect of performance entities is becoming readily available within seconds, a shift is being noticed regarding the key performance indicators. Thus, future studies are worth considering these advanced performance indicators such as index of game control, pressure efficiency, pressing index and transitional efficiency to better understand Ethiopian football.

5. LIMITATIONS

While this correlational study provides valuable insights into the relationships between tactical formation, technical-tactical performance, and match outcome in soccer, it cannot determine casual relationships without further experimental investigation. This limitation should be carefully considered while taking the study`s conclusions.

6. CONCLUSIONS

In Ethiopian Bet King Premier League, ball possession significantly varies across the common tactical formations of 4-4-2, 4-3-3, 4-2-3-1 and 4-1-4-1. The difference is too pronounced between the 4-4-2 and 4-3-3 formation as 4-3-3 formation is found to be associated with a superior ball possession. On the other way, while ball possession is significantly related with on target shots, on-target shot is significantly correlated with goals scored. Also, in Ethiopian Bet King Premier League match outcome is significantly correlated with those key technical tactical performance parameters such as on-target shots, and goals scored. In addition, match out-come is inversely related with goals conceded. Thus, in the absence of direct relationship between tactical formation and match out-come, there might be an indirect and complex relationship.

6.1. Implications

Coaches and soccer game analysis can leverage these insights to optimize team strategies, enhance player performance, and maximize the likelihood of favorable outcomes. Moreover, the study underscores the need for a holistic approach that integrates tactical insight with technical proficiency to achieve sustained outcomes in competitive soccer environments. To further our understanding of soccer performance, future research should examine additional factors influencing match outcomes, such as contextual factors, player characteristics, and coaching methodologies. In the end, combining data-driven analysis with real-world knowledge gained on the field can empower teams to navigate the complexities of modern soccer and pursue excellence in competitive settings.

Further researches on the area can better help to understand the phenomena by considering those advanced technical tactical performance indicators such as passing frequency, effective passes, pressure efficiency, pressing index, distance per-possession and ball recovery issues. Moreover, the approach on the matter has to acknowledge the complex interaction among the factors and moderating effect on one factor the other. This would help the practitioners to better understand the matter in depth and help to think the practical implications.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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