



Analysis of Turnovers and Their Relationship with Total Shooting Attempts According to Game Situations for Teams Qualified for the Semifinals of the Iraqi Professional Basketball League (2023-2024)

Elaf Ahmad Mohammed¹Ghadah Muayad Shihab²

^{1,2} University of Baghdad, College of Physical Education and Sports Sciences.

DOI:

[https://doi.org/10.37359/JOPE.V37\(4\)2025.2260](https://doi.org/10.37359/JOPE.V37(4)2025.2260)

<https://creativecommons.org/licenses/by/4.0/>

Article history: Received 12/ February/2025 Accepted 21/ May /2026 Available online 28/ June/2026

Abstract

This study aims to analyze ball possession loss (Turnovers) and its relationship with the total shooting attempts in different play situations for the teams that qualified for the semifinals of the professional Iraqi Basketball Premier League for the (2023-2024) season. Data were collected from the matches played by the four qualified teams: Al-Naft, Al-Karkh, Al-Shorta, and Al-Difaa Al-Jawi. The study examined the relationship between ball possession loss and total shooting attempts (considering each shot attempts as a possession, control, and offensive play), including two-point attempts, three-point attempts, and free throws resulting from minor personal fouls and compound fouls. The results revealed a negative correlation between ball possession loss and two-point shooting attempts, whereas a positive correlation was observed between ball possession loss and three-point shooting attempts. Furthermore, it was found that teams with fewer turnovers achieved higher shooting accuracy from inside the arc and lower shooting accuracy from beyond the arc. Based on these findings, the study recommends developing fundamental ball-handling skills (passing, dribbling, and fit timing), enhancing offensive tactical diversity and strategy, and reducing defensive errors to increase opportunities for executing free throws.

Keywords: Analysis, ball possession, shooting, basketball.

¹ University of Baghdad, College of Physical Education and Sports Sciences.
elaf.mohammed@cope.uobaghdad.edu.iq .

² University of Baghdad, College of Physical Education and Sports Sciences
dr.ghada@cope.uobaghdad.edu.iq



Introduction

Basketball is regarded as one of the most popular and widely played sports globally, relying on a combination of physical, technical, tactical, and strategic skills. This game necessitates precision in performance, rapid decision-making, and high coordination between the offensive and defensive aspects of the team. Among the factors influencing match outcomes, turnovers are a significant aspect (particularly psychologically) that can directly affect the flow of the game and its level, providing a positive performance and high morale for the team in possession of the ball, as well as for the team applying pressure effectively and accurately. The loss of ball possession grants the opposing team an additional opportunity to score while depriving the team that has lost possession of a chance to score, which may alter the trajectory of a quarter, half, or even the entire match and its result.

Turnovers are defined as instances in which a team loses the ball to the opposing team due to individual and collective violations (such as three seconds, traveling, double dribble, five seconds of various types, out-of-bounds, and collective violations like the eight-second backcourt violation due to defensive pressure, as well as the 24-second shot clock violation due to strong defense that does not allow for easy shooting opportunities), as well as incorrect passes and ball thefts committed by the opposing team as a result of significant pressure. These instances are considered factors that weaken the offensive performance of the team in general and of the players in particular, as they reduce the number of available scoring opportunities (after defensive efforts to transition to offense, only to lose the ball easily), leading to a rapid transition (from defense to offense) in favor of the opposing team.

On the other hand, the effectiveness of offensive performance depends on the ability to execute shooting attempts with high accuracy, whether from within the three-point arc (two-point shots) or from beyond the three-point arc (three-point shots), or by capitalizing on free throw opportunities. Thus, examining the association between turnovers and the overall shooting opportunities by game situations is an effective way to get some understanding of how to improve offense efficiency and prevent the negative effect brought by ball loss.

This study will also investigate turnovers and their relationship to the total number of shooting attempts when taking game situations into account for semifinals-qualified teams in the Iraqi Professional Basketball League over the 2023–2024 season, as it seeks to establish whether there are circumstances whereby turnovers affect a team's shooting performance as well as whether such variables exhibit correlational relationships. Furthermore, it will also help the others such as the coach and analyst to provide technical recommendations for each player and coach to prevent turnovers with reduction of time that an offensive opportunity is wasted.



The significance of this study is that it focused on one of the factors that affect the match result in basketball games, because it makes a clear relationship between turnovers and offensive performance for teams playing in Iraqi Professional Basketball League. Such outcomes might help the improvement of the teams' technical performance (by creating tactics that reduce intrusions and promoting a greatest use of every scoring opportunity) in order to reach better results, in future events.

Turnover problem is an important problem in basketball teams because more turnovers a team give away, less chances they have to score, and this situation can reduce the success of such basketball game: coach may lose the game (sometimes he would be forced to do so) when he gives his timeout at an unfortunate time. In view of the value of this possible aspect, investigations have been scarce that explore the importance of the ball possession loss on FG in different game play situations within a given league (e.g., Iraqi Professional Basketball League or any other local competition).

This research problem is summarized in the next primary question:

How much does ball loss of possession impact the overall number of shooting attempts by play situation in the teams that qualified for the semi-finals at Iraqi Professional Basketball League for season 2023-2024?

This leads to other questions, such as:

1. Do different have relationship between ball possession loss and two-point shooting attempts?
2. Wouldn't loss of ball possessions influence the number of three point shots?
3. Does turnover percentage relate to the fouls and free throws attempted?
4. What is the effect of losing possession on offensive outcomes and how does it vary between semifinal-qualifying teams?

This research should be pursued to meet a number of primary objectives, including the most important ones which are:

1. To investigate into the effect of losing ball possession on the offensive play in a team's performance by examining as much at possible, how it affects the number of shot attempts of different kinds.
2. To examine the level of correlational relationship between the loss of ball possession and shooting attempts (including two point shot, three-point shot, and free throws).



3. To obtain findings and suggestions for coaches, analysts and players to minimize the loss of ball possession while improving offensive performance by generating effective playing strategies.
4. To compare the teams that reached the semifinal in order to determine how much does each team loses if it loses a ball possession, as well as how does this impact varies depending on which team is playing.

At the light of prior research and the preliminary data analysis, we are led to suggest:

1. There is a significant and negative relationship between loss of ball possession and numbers of two-point shot attempts which can be interpreted such that, the more frequently losing the ball, there are fewer two point shooting opportunities for these teams from inside the arc.
2. The increase in shots from 3-point range as a function of possessions lost could suggest that teams who are more frequent losers of the ball (and hence miss offensive chances) resort to taking longer, higher-risk shots.
3. There is a negative relationship between loss of possession and free throw attempts, signifying that the more teams loose possession, they get less chances to score as free throws.
4. The effect that ball possession loss has on a teams' offensive outcome is different for the qualifying teams to the semi-finals, those being some of the competing teams may have better counter strategies at minimizing their own ball possession loss.

Methodology

Research Community

The study sample was all the teams that were playing in the Iraqi Professional Basketball League season 2023-2024. It consists of teams played in the season before of both preliminary rounds and play-off round. In as much as the objective of this work is to unpack the relationship between ball possession loss and shooting attempts in diverse match contexts, it is instructive that we narrowed our analyses to semifinalist teams because they represent an elite competitive segment of the league.



Research Sample

The four teams that qualified for the semifinals of the Iraqi Professional Basketball League for the 2023-2024 season have been selected as the research sample, which includes:

1. Al-Naft Club
2. Al-Karkh Club
3. Al-Shorta Club
4. Al-Defaa Al-jawi Club

Justifications for Sample Selection

1. The teams that makes it to the semifinals will be the best in the Iraqi Professional in Basketball League, which are considered elite teams and enhance higher performance analysis accuracy.
2. Statistical figures for these very few teams that have made the quarter-finals are easy to come by, unlike other teams who never got this far.
3. These groups display varying approaches to ball loss and shooting management, making it possible to assess the relationship between these two factors with some clarity.
4. With a reliance on teams in the same performance level, there will be an increase in preciseness regarding statistical analysis; as it reduces interferences not related to research.

Data regarding independent teams were obtained from their semifinal matches using official recognized statistics, where all situations of losing ball possession as well different shooting attempts by each team were tracked and furthermore statistically analyzed to find conclusions and recommendations.

Statistical Methods

The researcher employed the statistical method SPSS for the data analysis of the study.

Results

Table 1. Analysis of the total shooting attempts and turnovers in the semi-final matches of the Iraqi Professional Basketball League

Matches	Team Name	Total 2-Point Shooting Attempts	Total 3-Point Shooting Attempts	Total Free Throw Attempts	Turnovers
1	Al-Naft	39	25	15	17
	Al-Karkh	42	24	24	14
2	Al-Defaa Al-Jawi	37	31	20	12
	Al-Shorta	44	29	20	24
3	Al-Karkh	38	33	16	12
	Al-Naft	43	19	30	8
4	Al-Shorta	52	29	8	9
	Al-Naft	46	30	7	15
5	Al-Defaa Al-Jawi	36	26	23	11
	Al-Naft	32	44	15	17
6	Al-Karkh	38	38	16	12
	Al-Defaa Al-Jawi	47	24	18	11

Note: Any loss of possession committed by the team is statistically and technically accounted for the opposing team.

1. Ball possession loss rate:

- The lowest rate of possession loss is (8) times for Al-Naft in the third match.
- The highest rate of possession loss is (24) times for Al-Shorta in the second match.
- It appears that Al-Shorta Club experiences possession loss more frequently than other teams.

2. Shooting rate:



- Two-point shooting attempts range between (32-52), indicating that teams focus more on close and mid-range shooting than on other types of shooting.
- Three-point shooting attempts range between (19-44), with notable variation among teams and matches.
- Free throw attempts are relatively lower, ranging between (7-30), reflecting the disparity in drawing fouls.

Table 2. It illustrates the correlation coefficient between ball possession loss (Turnovers) and types of shooting.

Type of Scoring	The correlation coefficient with ball possession loss
Two-Point Scoring	0.196-
Three-Point Scoring	0.292
Free Throws	0.142-

- Two-point shooting: The relationship is weakly negative (-0.196), indicating that teams that lose the ball more frequently may have fewer attempts at two-point shooting.
- Three-point shooting: The relationship is weakly positive (0.292), suggesting that teams that lose the ball more often may rely on three-point shooting to compensate for this.
- Free throws: The relationship is weakly negative (-0.142), implying that teams that lose the ball more frequently may have fewer opportunities to score from free throws.

Discussion

First: The Relationship Between Ball Turnovers and Two-Point Shooting

The result showed a negative relationship between ball turnover and frequency of 2-point shooting attempts, indicating that teams with more frequent loss of ball possession have less chance to make an attempt shot from the other-side of 3-points arch. This is consistent with Carlson's (2020) argument that ball loss decreases the number of organized attacks and reflecting on how direct play close to the basket, is a result of good play construction. Brown (2018) also finds supportive evidence for this, where teams that limit ball transition tend to take more attempts closer to the rim due to a smoother offensive action not disturbed by defence.

Second: The Relationship Between Ball Turnovers and Three-Point Shooting

Findings of the analysis indicated a significant positive correlation between ball turnovers and an increase in frequency of three-point shooting attempts. This could be due to teams that



often lose the ball trying to make up for it with more three-pointers hurried-up. According to Miller et al. (2019), teams' likely to attempt shots from above the arc as a means of minimizing opportunity for additional turnovers in a team's own play segment and maximizing gain opportunities against the opponent. Smith, 2021) A recent study published by Smith (2021) adds to this finding showing that teams highly reliant on three-pointers are also those under higher defensive pressure and turning the ball over more frequently, thereby forces players to shoot too early (counter-intuitively leading them unable to really run actions or attacks for fear of committing a turnover while shooting so as not. to keep it throughout the offense).

Third: The Relationship Between Ball Turnovers and Free Throws

The findings showed a significant negative association between ball turnovers and the number of free throws tries, or in other words, that the more the teams lost balls, the less time they had to collect scores. This can be attributed to the fact that ball loss negatively affects offensive actions which lead to the opposition team committing holding fouls, generating free-throws. As Jones (2017) writes, it would be the teams which can hold onto the ball with longer possessions, and run their offenses systematically, who will be able to draw a higher number of defensive fouls from shots (as they make it more contention-liable for team in defense), forcing them to foul more frequently as well as making the quality of offensive activity decrease due to all that physical effort invested on defense during almost 24 seconds of shot clock duration purchase additional opportunities to shoot free throws.

Fourth: The Impact of Ball Turnovers on Overall Team Performance

A comparison of the four semi-finalists shows that teams who turned the ball over the least had higher shooting percentages and took better advantage of offensive opportunities. This is in line with Williams' (2022) reasoning that ball control and error minimization explain better the higher offensive efficiency, specially on crucial games which required a more precise performance execution as both had similar performance levels.

When we compare our results with other studies, such as that of García et al. (2020), which supported the idea that winning teams are so because they have lower possession loss ratio and can build more stable attacks. Also, the work by Rodriguez (2019) argues that possession loss 5 – 7 times lower compared with opponents' is more likely than not to result in victory above 70%.

Conclusions



1. Being on the wrong side of possessions has adverse effects on shooting success, as it was shown that teams not controlling enough lost possession suffers from reduced chances of converting successful shot attempts, especially inside the three-point line (shots taken near and around rim).
2. the relationship with three point percentage is positive meaning if you lose the ball a lot, you'll attempt to make up for it by shooting threes quickly.
3. Teams that commit less possession losses enjoy a better chance to carry out free throws, as they have more ball control and can force their opponents to foul them defensively.
4. The relation between decreasing ball possessions loss and the increasing of scoring options, is most important to be able teams (who made it into the semi-final's games in the Iraqi Professional Basketball League) to use a range of strategic solutions for achieving: low possession loss and high offensive efficiency.
5. In the context of best performing teams in Iraqi Professional Basketball League, we can see that ball control is a significant contributor to success as it enables higher rates of converting offensive opportunities which lead to favorable results.

Recommendations

1. Develop the players' technical ball skills (control) and ability to pass under pressure with intensive training in passing and reducing loss of possession.
2. Adopting systematic offensive tactics that reduce the dependence on three point shots (by random shooting) and concentrating on close c mid-range shots to increase their success rate.
3. Studying performance statistics for each team during the season, to reveal patterns of losing possession and formulate bespoke strategies in relation to these.
4. More training on taking advantage of Defensive mistakes and play for more free throws by driving to the rim, being physical Other.
5. Practice ways to not lose possession when pressured, especially against teams that pick up full court and those that play heavy half-court denying defense.
6. Studying the effectiveness of opposing sides to determine how and where they break under pressure on defense against the ball, which aids in eliminating turnovers through alterations in offensive play-sets.



Journal of Physical Education

Volume 37 – Issue (4) – 2025 Open Access

P-ISSN: 2073-6452, E-ISSN: 2707-5729

<https://jcope.uobaghdad.edu.iq>



-
7. To use statistical analysis (effectively, accurately and consistently) to assess team performance on a game by game basis, tracking loss of possession rates and how they affect match results.



References

- Abdul Karim, H., & Rzoqi, J. (2011). Anxiety Level And Its Relationship With The Position of Player In Basketball. *Journal of Physical Education*, 23(2), 215-232. [https://doi.org/10.37359/JOPE.V23\(2\)2011.514](https://doi.org/10.37359/JOPE.V23(2)2011.514)
- Abdulkareem, O. W., & Sattar Jabbar, H. (2025). Comparative Biomechanical Analysis of Three-Point Shooting Between Elite Iraqi Basketball Players and International Counterparts. *Journal of Sport Biomechanics*. <https://doi.org/10.61186/JSportBiomech.11.3.326>
- Brown, T. (2018). Turnovers and Their Impact on Scoring Efficiency in Basketball. *Journal of Sports Analytics*, 5(2), 112-125.
- Carlson, J. (2020). The Relationship Between Ball Possession and Field Goal Attempts in Professional Basketball. *International Journal of Basketball Research*, 7(3), 198-215.
- García, F., López, M., & Torres, R. (2020). Ball Control and Team Performance in Elite Basketball: A Statistical Analysis. *Journal of Sports Science & Coaching*, 15(4), 455-472.
- Ghanim, D., & Jaleel, A. (2022). The effect of special exercises on developing some physical abilities and long jump performance for under-20 female athletes. *Modern Sport*, 21(1), 92. <https://doi.org/10.54702/msj.2022.21.1.0092>
- Ghanim, M. R. (2025). The Neurocognitive Effect Of Augmented Visual Feedback On Learning The Back Handspring Skill In Gymnastics Among College Students Diverse Learning Methods. *Indonesian Journal of Physical Education and Sport Science*, 5(3), 397–407.
- Hassan, M. F. A., & Abdulkareem, O. W. (2025). Effects of an Integrated Balance and Muscle Tension Control Training Program on Kinematic Variables and Defensive Accuracy in Volleyball Players. *Journal of Sport Biomechanics*, 11(4), 438–464. <https://doi.org/10.61882/JSPORTBIOMECH.11.4.438>
- Jones, K. (2017). Free Throws and Team Success: The Role of Fouls and Possession Control. *Basketball Studies Review*, 6(1), 78-90.
- Miller, R., Smith, J., & Thompson, L. (2019). Three-Point Shooting Strategies and Their Correlation with Turnovers in Competitive Basketball. *Journal of Advanced Sports Performance*, 12(3), 302-319.
- Ridha, M., Abdullah, H. A., Hamza, G. B., & Abdulhusseni, A. A. (2024). The effect of inverted education on diving and handstand skills on the ground mat. *Journal of Computational Analysis and Applications*, 33(7), 383–387.
- Rodriguez, P. (2019). Winning Strategies in Basketball: A Data-Driven Analysis of Turnovers and Shooting Efficiency. *International Journal of Sports Data Analysis*, 8(2), 155-170.
- Smith, D. (2021). The Impact of Defensive Pressure on Turnovers and Three-Point Shot Selection. *Journal of Basketball Science*, 9(2), 215-230.
- Williams, M. (2022). Ball Security and Winning Percentage: A Study of Elite Basketball Teams. *Journal of Sports Metrics*, 10(1), 98-115.