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**Mental Toughness and Performance (Ranking Points) on the Basis of Gender among
Hockey Players in Kenya's Premier League**

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Mental Toughness and Performance (Ranking Points) on the Basis of Gender among Hockey Players in Kenya's Premier League



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Abstract

Purpose: Mental toughness is a critical psychological attribute associated with sustained athletic performance under competitive pressure. While previous studies suggest that male athletes often report higher mental toughness levels than females, limited evidence exists regarding whether gender moderates the mental toughness–performance relationship in African elite team sports. This study examined the relationship between mental toughness and performance (ranking points) on the basis of gender among hockey players competing in the Kenya Premier League.

Methodology: Using a cross-sectional analytical design, data were collected from 288 elite players (144 males and 144 females) drawn from 12 Premier League teams. Mental toughness was assessed using the Mental Toughness Questionnaire (MTQ48), measuring confidence, commitment, control, and challenge, while performance was operationalized through official league ranking points. Non-parametric analyses and moderated regression techniques were employed.

Findings: Results revealed that although male players recorded marginally higher mean scores across mental toughness components, gender did not significantly moderate the relationship between mental toughness and performance. Mental toughness remained a significant predictor of performance for both male and female players.

Unique Contribution to Theory, Practice and Policy: These findings suggest that mental toughness contributes to elite hockey performance irrespective of gender, underscoring the need for inclusive psychological skills training in player development programs.

Keywords: *Mental Toughness, Gender, Performance, Field Hockey, Kenya Premier League*

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INTRODUCTION

Mental toughness has been widely recognized as a critical psychological determinant of success in elite sport, enabling athletes to consistently perform at high levels despite pressure, adversity, and competitive demands. Conceptualized as a multidimensional construct, mental toughness reflects an individual's capacity to remain focused, confident, committed, and emotionally regulated when faced with challenging sporting situations (Clough et al., 2002; Nicholls et al., 2009). Athletes who demonstrate high levels of mental toughness are better equipped to cope with stress, maintain motivation, and sustain performance across training and competition contexts (Cowden, 2017; Gucciardi et al., 2015).

The dominant theoretical framework underpinning mental toughness research is the Four Cs model, which identifies confidence, commitment, control, and challenge as its core components (Clough et al., 2002). Confidence reflects an athlete's belief in their abilities; commitment denotes persistence toward goal attainment; control involves emotional and attentional regulation; and challenge represents the tendency to perceive pressure and adversity as opportunities for growth. Empirical evidence across a range of sports including rugby, soccer, basketball, and combat sports has demonstrated positive associations between these components and objective performance indicators (Sheard & Golby, 2004; Slimani et al., 2016; Steffen et al., 2020).

Despite broad consensus on the performance relevance of mental toughness, findings concerning gender differences remain inconclusive. Several studies report that male athletes tend to score higher than females on overall mental toughness, particularly in confidence and emotional control (Crust & Keegan, 2010; Nicholls et al., 2009). These disparities have often been attributed to differences in socialization processes, competitive exposure, coaching expectations, and psychological skill development opportunities (Brand et al., 2017). Male athletes, for instance, may receive greater encouragement toward assertiveness and risk-taking behaviors, which align closely with confidence and control dimensions of mental toughness.

Conversely, emerging research suggests that although mean gender differences in mental toughness may exist, gender does not necessarily moderate the relationship between mental toughness and performance outcomes (Cowden, 2017; Gucciardi et al., 2015). This perspective posits that mental toughness functions as a universal psychological resource, contributing to performance enhancement regardless of gender. As such, the predictive value of mental toughness for performance may be consistent across male and female athletes, even where baseline levels differ.

Within the Kenyan sporting context, field hockey is a highly competitive team sport played at elite levels by both men and women in the Kenya Premier League. Players operate under substantial physical, tactical, and psychological demands throughout extended competitive seasons. However, despite the sport's prominence and the growing emphasis on psychological skills training, limited empirical research has examined whether gender influences how mental toughness relates to performance among elite hockey players in Kenya. Existing local studies have largely focused on technical, tactical, or general psychological skills, leaving a notable gap regarding gender-based mental toughness dynamics in elite hockey.

Addressing this gap, the present study specifically examines whether gender moderates the relationship between mental toughness and performance (ranking points) among hockey players in the Kenya Premier League. By focusing on elite male and female players within the same competitive structure, the study seeks to contribute context-specific evidence to the mental toughness literature and inform inclusive athlete development and psychological skills training programs.

Although the Four Cs model (control, commitment, confidence, challenge) is a widely used and practically useful framework for conceptualizing mental toughness (Clough, Earle, & Sewell, 2002), contemporary psychometric and conceptual critiques recommend caution. Several studies have questioned the MTQ-48's factorial stability across samples and cultures, arguing that the measure may conflate trait and state aspects of mental toughness and that its factor structure is not uniformly supported without local validation (Gucciardi et al., 2015; Perry, 2021). In response to those concerns, practitioner-focused iterations such as the MTQ-Plus (AQR International) have been developed to expand item coverage and improve diagnostic profiling while retaining the Four Cs language; using or comparing such enhanced instruments (or reporting confirmatory factor analyses for adapted MTQ items) strengthens construct validity when working in non-Western contexts (AQR, 2017). The present study therefore treats MTQ-derived scores as theoretically useful but empirically contingent: we report scale adaptation details and recommend CFA or alternative factor checks to demonstrate whether the Four Cs hold in the Kenya Premier League sample.

The Kenya Premier League for field hockey (administered by the Kenya Hockey Union) represents the country's top domestic competition with multi-team, season-long competition structures, national selection visibility, and formal league standings, features that justify describing participating players as elite domestic athletes rather than recreational players (Kenya Hockey Union, 2024). However, elite domestic status does not automatically imply broad access to specialist psychological support: while there are emerging mental-health and athlete-wellness initiatives and occasional awareness campaigns (player-led mental health outreach), systematic, club-level employment of full-time sport psychologists remains limited in Kenyan team sports compared with better-resourced international programs (Heads First, 2020; local university reports). This resource gap matters because psychological-skill development is both a function of individual traits and of organized support (coaching, sport psychology services, and monitoring). Without routine psychological screening, standardized MT-informed profiling, or embedded sports-psychology staff, clubs and national selectors cannot reliably use psychological data (MTQ profiles) for selection, monitoring, or intervention decisions, an applied problem this study is intended to help address (Rintaugu et al., 2014).

To reduce Western-centric bias and ground interpretation in regional evidence, the manuscript draws on research on psychological resilience and performance among East African athletes. Work on East African distance runners highlight resilience, socio-economic motivation, and culturally embedded coping styles as important psychological contributors to endurance success and provides a comparative baseline for interpreting mental toughness in Kenyan team-sport athletes (Peters, 2024; narrative reviews of East African running). Moreover, Kenyan university-based studies and theses examining stress, coping, and overtraining markers among local athletes and

teams show that Kenyan athletes face contextually specific stressors; academic pressures, limited resources, and travel logistics that shape psychological functioning and the availability/effectiveness of mental-skills training (Rintaugu et al., 2015). Integrating these regional studies helps situate results: individual MTQ scores are expected to contribute to team outcomes (ranking points) via emergent group processes (collective efficacy, team resilience) but their interpretability depends on whether clubs provide supportive structures (coaching routines, shared leadership, or psychological services) that allow individual psychological assets to be mobilized at the team level (Fletcher & Sarkar, 2012; Morgan, Fletcher, & Sarkar, 2015).

Statement of the Problem

Mental toughness is widely recognized as a critical determinant of elite athletic performance; however, uncertainty persists regarding whether gender influences its predictive relationship with competitive success. Although Kenya historically achieved strong international field hockey performances, objective indicators reflect performance instability in the modern era. Since the introduction of the International Hockey Federation (FIH) world ranking system in 2003, Kenya's men's team has fluctuated markedly, ranging from a low of 63rd in 2004 to a peak of 37th in 2017, without sustained top-tier positioning thereafter. Such variability suggests multidimensional gaps in elite preparation, with psychological resilience and mental toughness representing plausible contributing factors.

Existing literature documents that male athletes often report higher mean levels of mental toughness than females, particularly in confidence and emotional control (Crust & Keegan, 2010; Brand et al., 2017). However, evidence remains inconclusive regarding whether gender moderates the mental toughness–performance relationship. Distinguishing between mean-level differences and differential predictive effects is critical: even if mental toughness levels vary by gender, it remains unclear whether mental toughness is more or less predictive of performance for one gender over the other. Within the Kenyan context, no empirical study has examined this moderating effect among elite hockey players in the Kenya Premier League. This gap limits evidence-based decisions regarding whether psychological skills interventions should be gender-neutral or gender-specific. Therefore, this study examines whether gender moderates the relationship between mental toughness and performance (ranking points) among elite hockey players in Kenya.

METHODOLOGY

This study adopted a cross-sectional analytical research design to examine the relationship between mental toughness and performance on the basis of gender among hockey players in the Kenya Premier League. The study targeted elite male and female players drawn from teams participating in the Premier League during the 2022 season. Stratified random sampling was used to ensure equal representation of male and female athletes, resulting in a sample of 288 players comprising 144 males and 144 females selected from 12 teams. Mental toughness was measured using an adapted version of the Mental Toughness Questionnaire 48 (MTQ48), which assesses the four core components of mental toughness: confidence, commitment, control, and challenge, using a five-point Likert scale. Performance was operationalized through objective team ranking points obtained from official Kenya Hockey Union match records. Data were analyzed using SPSS, with normality assessed through the Shapiro–Wilk test. Due to non-normal data distribution, non-

parametric statistical techniques were employed, including Mann–Whitney U tests to examine gender differences and Spearman’s rho correlation and moderated regression analyses to determine the relationship between mental toughness and performance across gender categories. Statistical significance was set at $p < .05$.

RESULTS

Gender Differences in Mental Toughness

Descriptive analysis revealed that male hockey players recorded marginally higher mean scores across all four components of mental toughness; challenge, commitment, control, and confidence compared to female players. However, these differences were minimal and largely overlapping across gender categories.

Table 1: Hypothesis Test Summary for Challenge Component of MT across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Challenge component of MT is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.593	Retain the null hypothesis.

Table 2: Independent-Samples Mann-Whitney U Test Summary for Challenge Component (n=288)

Total N	288
Mann-Whitney U	9992.500
Wilcoxon W	20432.500
Test Statistic	9992.500
Standard Error	703.085
Standardized Test Statistic	-.534
Asymptotic Sig.(2-sided test)	.593

The distribution of the challenge component of mental toughness across gender categories demonstrated substantial overlap between male and female players.

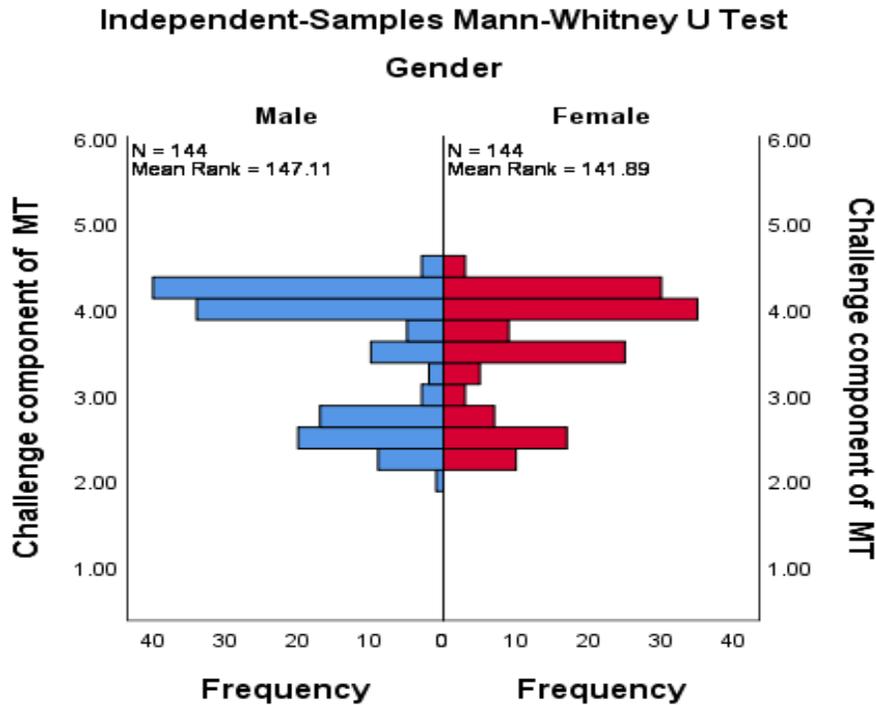


Figure 1: Distribution of the Challenge Component of MT across Gender Categories

Similarly, analysis of the commitment component showed no statistically significant difference between male and female players.

Table 3: Hypothesis Test Summary for Commitment Component of MT across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Commitment component of MT is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.039	Reject the null hypothesis.

Table 4: Independent-Samples Mann-Whitney U Test Summary for Commitment Component of MT across Gender(n=288)

Total N	288
Mann-Whitney U	11810.500
Wilcoxon W	22250.500
Test Statistic	11810.500
Standard Error	700.543
Standardized Test Statistic	2.059
Asymptotic Sig.(2-sided test)	.039

The distribution of commitment scores across gender categories is presented below.

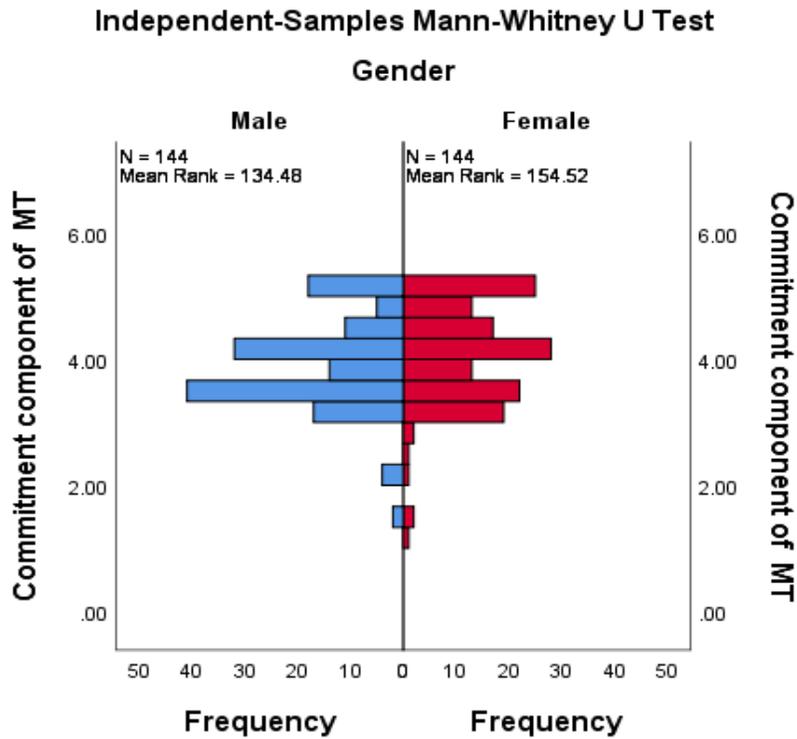


Figure 2: Distribution of the Commitment component of MT across Gender Categories

Analysis of the control component of mental toughness revealed no statistically significant gender-based differences.

Table 5: Hypothesis Test Summary for Control Component of MT across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Control component of MT is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.289	Retain the null hypothesis.

Table 6: Independent-Samples Mann-Whitney U Test Summary for Control Component of MT across Gender

Total N	288
Mann-Whitney U	9621.000
Wilcoxon W	20061.000
Test Statistic	9621.000
Standard Error	704.642
Standardized Test Statistic	-1.060
Asymptotic Sig.(2-sided test)	.289

The graphical distribution of control scores across gender categories is shown below.

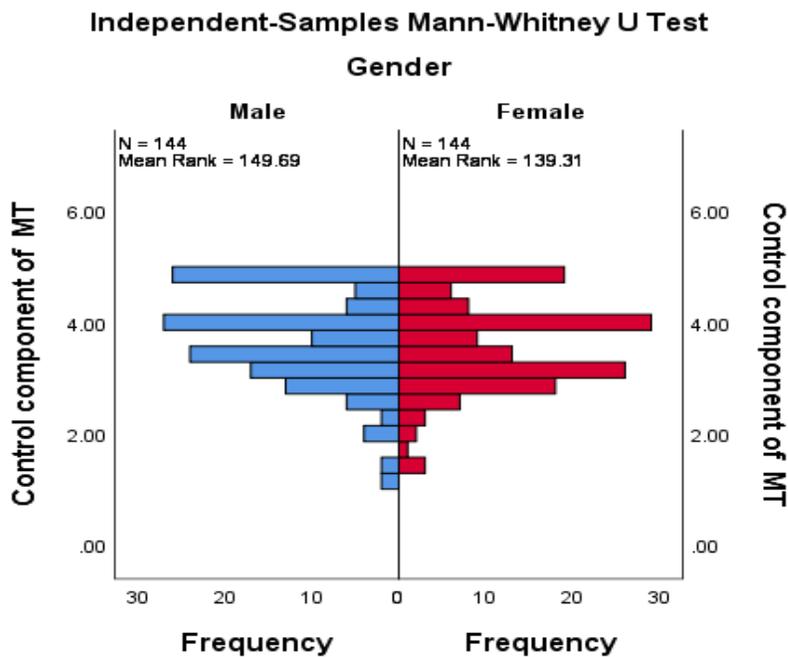


Figure 3: Distribution of the Control Component of MT across Gender Categories

Similarly, no statistically significant difference was observed between male and female players in the confidence component of mental toughness.

Table 7: Hypothesis Test Summary for Confidence Component of MT across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Confidence component of MT is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.882	Retain the null hypothesis.

Table 8: Independent-Samples Mann-Whitney U Test Summary for Confidence Component of MT across Gender

Total N	288
Mann-Whitney U	10472.500
Wilcoxon W	20912.500
Test Statistic	10472.500
Standard Error	703.293
Standardized Test Statistic	.149
Asymptotic Sig.(2-sided test)	.882

The distribution of confidence scores across gender categories is illustrated below.

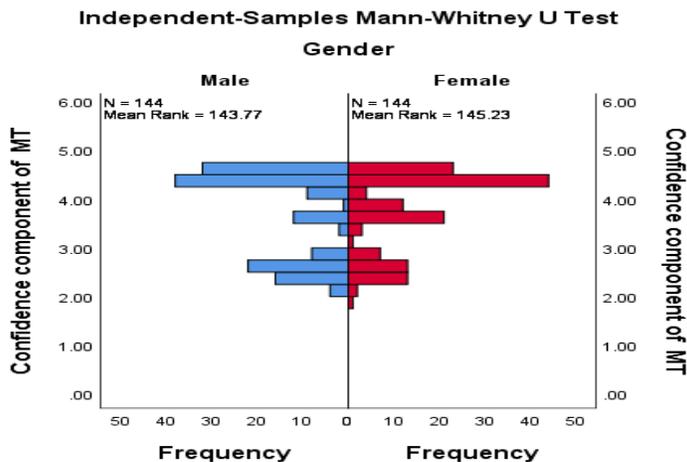


Figure 4: Distribution of the Confidence Component of MT across Gender Categories

Composite Mental Toughness across Gender

When the four components were combined to generate the overall mental toughness (components average) score, the results indicated no statistically significant difference between male and female players.

Table 9: Hypothesis Test Summary for Mental Toughness (components average) score across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Mental Toughness (components average) score is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.418	Retain the null hypothesis.

Table 10: Independent-Samples Mann-Whitney U Test Summary for Mental Toughness (components average) score across Gender

Total N	288
Mann-Whitney U	10940.500
Wilcoxon W	21380.500
Test Statistic	10940.500
Standard Error	706.669
Standardized Test Statistic	.810
Asymptotic Sig.(2-sided test)	.418

The distribution of overall mental toughness scores across gender categories is shown below.

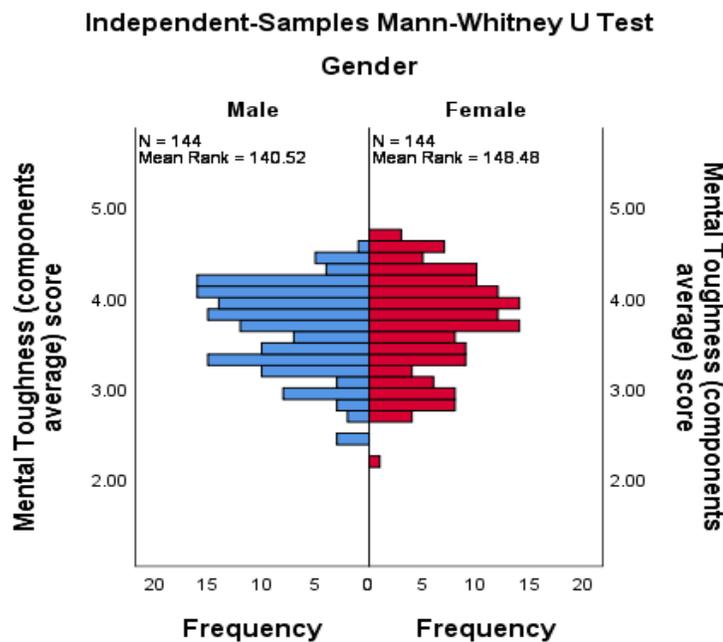


Figure 5: Distribution of Mental Toughness (Components Average) across Gender Categories

Further analysis using the mental toughness percent of maximum possible (POMP) score similarly revealed no statistically significant gender differences.

Table 11: Hypothesis Test Summary for Mental Toughness percent of Maximum Possible (POMP) Score across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Mental Toughness percent of maximum possible (POMP) score is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.418	Retain the null hypothesis.

Table 12: Independent-Samples Mann-Whitney U Test Summary for Mental Toughness percent of maximum possible (POMP) score across Gender

Total N	288
Mann-Whitney U	10940.500
Wilcoxon W	21380.500
Test Statistic	10940.500
Standard Error	706.669
Standardized Test Statistic	.810
Asymptotic Sig.(2-sided test)	.418

The distribution of POMP scores across gender categories is illustrated below.

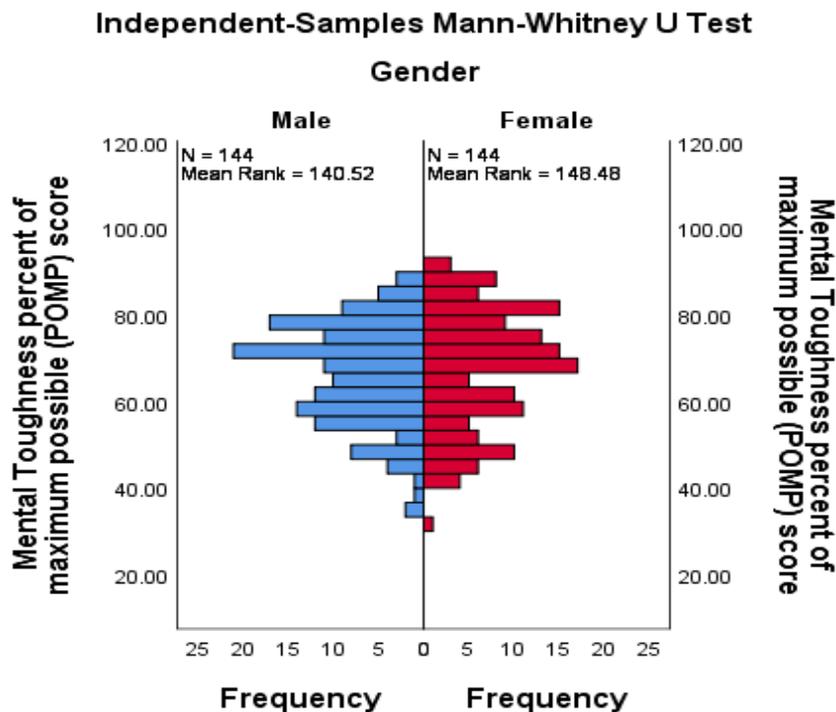


Figure 6: Distribution of Mental Toughness percent of Maximum Possible (POMP) Score across Gender Categories

Gender Differences in Performance (Ranking Points)

Performance outcomes, measured using team ranking points, were compared across gender categories. The results revealed no statistically significant difference in performance points between male and female players.

Table 13: Hypothesis Test Summary for Performance Points across Gender

Null Hypothesis	Test	Sig.	Decision
The distribution of Performance points is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.

Table 14: Independent-Samples Mann-Whitney U Test Summary for Performance Points across Gender

Total N	288
Mann-Whitney U	12787.000
Wilcoxon W	23227.000
Test Statistic	12787.000
Standard Error	700.850
Standardized Test Statistic	3.452
Asymptotic Sig.(2-sided test)	.001

The distribution of performance ranking points across gender categories is presented below.

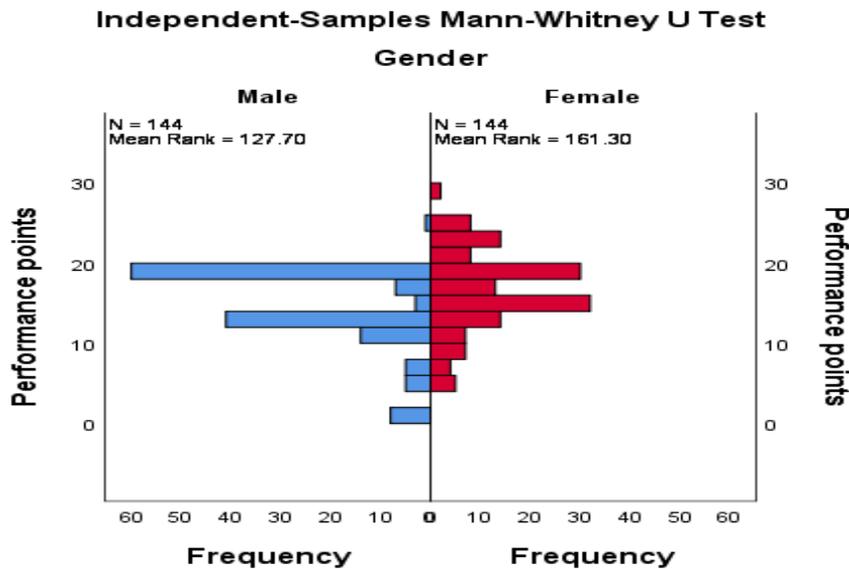


Figure 7: Distribution of for Performance Points across Gender

Relationship between Mental Toughness and Performance across Gender

Correlation analysis demonstrated a statistically significant positive relationship between mental toughness and performance for both male and female players. Higher mental toughness scores were associated with higher performance ranking points, indicating that mental toughness contributed positively to competitive outcomes irrespective of gender.

Table 15: Correlation Analysis

		Challenge	Commitment	Control	Confidence	MT	Performance
Challenge component of MT	Correlation Coefficient	1.000	.026	.021	.847	.727**	.634**
	Sig. (2-tailed)	.	.655	.719	.000	.000	.000
	N	288	288	288	288	288	288
Commitment component of MT	Correlation Coefficient	.026	1.000	.194**	.045	.472**	.463**
	Sig. (2-tailed)	.655	.	.001	.446	.000	.000
	N	288	288	288	288	288	288
Control component of MT	Correlation Coefficient	.021	.194**	1.000	.010	.493**	.446**
	Sig. (2-tailed)	.719	.001	.	.863	.000	.000
	N	288	288	288	288	288	288
Confidence component of MT	Correlation Coefficient	.847**	.045	.010	1.000	.726**	.634**
	Sig. (2-tailed)	.000	.446	.863	.	.000	.000
	N	288	288	288	288	288	288
Mental Toughness (components average) score	Correlation Coefficient	.727**	.472**	.493**	.726**	1.000	.916**
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000
	N	288	288	288	288	288	288
Performance points	Correlation Coefficient	.634**	.463**	.446**	.634**	.916**	1.000
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.
	N	288	288	288	288	288	288

To examine whether gender moderated the relationship between mental toughness and performance, a moderated regression analysis was conducted. Mental toughness significantly predicted performance outcomes; however, the interaction between mental toughness and gender was not statistically significant, indicating that gender did not moderate the mental toughness–performance relationship.

Table 16: Model Summary Analysis on Gender

R	R-sq	MSE	F	df1	df2	P
.9095	.8271	4.7609	452.9322	3.0000	284.0000	.0000

Model

	Coeff	Se	T	P	LLCI	ULCI
Constant	12.6749	.4070	31.1388	.0000	11.8737	13.4762
MTPOMPsc	.4132	.0335	12.3419	.0000	.3473	.4790
Age Code	1.6094	.2574	6.2520	.0000	1.1027	2.1161
Int_1	-0.0315	.0204	-1.5426	.1240	-0.0716	.0087

Discussion

The purpose of this study was to examine whether gender moderates the relationship between mental toughness and performance among hockey players competing in the Kenya Premier

League. The findings indicate that although male players recorded marginally higher mean scores across the four components of mental toughness; challenge, commitment, control, and confidence gender differences were largely non-significant. This suggests that elite male and female hockey players competing within the same league structure possess broadly comparable psychological capacities for coping with competitive pressure. Similar findings have been reported among athletes exposed to equivalent training and competitive environments (Gucciardi et al., 2015; Cowden, 2017), indicating that structural equality in competition may reduce psychological disparities.

A significant gender difference emerged only in the commitment component, with male players demonstrating higher persistence-related scores. This aligns with prior research suggesting that male athletes may report higher task orientation and persistence, potentially reflecting socialization processes or motivational climates (Crust & Keegan, 2010; Nicholls et al., 2009). However, this isolated difference did not translate into significant variation in overall mental toughness, reinforcing the multidimensional nature of the construct and suggesting that composite psychological functioning may buffer against variation in individual components (Steffen et al., 2020).

Importantly, while performance ranking points differed significantly across gender categories, mental toughness itself did not differ meaningfully. This divergence indicates that performance disparities are unlikely to be explained solely by psychological attributes and may instead reflect structural and contextual factors such as resource allocation, competitive depth, historical investment, and league organization. Previous scholarship has similarly emphasized that performance outcomes in team sports are shaped by environmental and systemic conditions beyond individual psychological traits (Maleki et al., 2014; Mishra, 2018).

Most notably, correlation and regression analyses demonstrated that mental toughness was a strong and statistically significant predictor of performance for both male and female players. The absence of a significant interaction effect indicates that gender does not alter the strength or direction of the mental toughness–performance relationship. Rather than suggesting a null effect, this finding underscores the universality of mental toughness as a performance-enhancing psychological resource across the league. In practical terms, mental toughness appears to contribute to competitive success in a consistent manner irrespective of gender. This reinforces contemporary perspectives that conceptualize mental toughness as a broadly applicable psychological asset rather than a gender-contingent trait (Gucciardi et al., 2015).

A methodological consideration warrants attention. Mental toughness was measured at the individual level, whereas performance was operationalized using team-based ranking points. Linking individual psychological attributes to collective performance outcomes introduces inferential complexity, as ranking points are influenced by multiple interacting factors including team cohesion, tactical execution, coaching strategy, and opposition strength. Although mental toughness may contribute to team success through mechanisms such as collective efficacy and coordinated resilience, the cross-sectional design limits causal inference and does not fully disentangle individual from team-level effects. Future research employing multilevel modeling or longitudinal designs would allow more precise examination of how individual psychological attributes aggregate to influence collective performance outcomes.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study examined whether gender moderates the relationship between mental toughness and performance among hockey players competing in the Kenya Premier League. The findings indicated that although male players recorded marginally higher mean scores across the four components of mental toughness, gender differences were largely non-significant for challenge, control, confidence, and overall mental toughness. A statistically significant difference was observed only in the commitment component, with male players scoring higher than female players. Despite differences in performance ranking points across gender categories, mental toughness demonstrated a strong and statistically significant positive relationship with performance for both male and female players. Moderation analysis further confirmed that gender did not significantly alter the strength or direction of the mental toughness–performance relationship.

The study therefore concludes that mental toughness is a robust and gender-neutral predictor of performance among elite hockey players in the Kenya Premier League. While minor variations were observed in specific subcomponents, these did not meaningfully affect the overall predictive capacity of mental toughness. The absence of a moderating effect reinforces the interpretation of mental toughness as a universal psychological resource that contributes to competitive success irrespective of gender. Accordingly, psychological resilience, emotional regulation, confidence, and commitment should be regarded as foundational elements of elite athlete preparation across the league.

From a policy perspective, the findings support the implementation of standardized psychological baseline assessments within the Kenya Hockey Union (KHU). Establishing routine mental toughness profiling at league and national selection levels would enable systematic monitoring of psychological development, inform targeted mental skills interventions, and provide objective data to complement technical and physical selection criteria. Integrating psychological screening into national team selection processes may enhance evidence-based decision-making and long-term athlete development strategies.

Methodologically, future research should adopt longitudinal and multilevel designs to better capture the dynamic relationship between individual psychological traits and performance. In particular, the use of individual performance indicators, such as goals-to-minutes ratio, successful defensive interceptions, pass completion rates, or goalkeeper save percentages would allow more precise estimation of how individual mental toughness translates into measurable performance outputs. Such approaches would reduce reliance on team-based ranking points and strengthen causal interpretation of the mental toughness–performance relationship.

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