Effect of Selected Training Program on Motor Abilities of Youth Football Players of Manipur

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ABSTRACT

The purpose of the present study was to investigate the effect of selected training program on the motor abilities of youth football players of Manipur. A total of 120 youth football players aged 14–18 years were selected from four football clubs and academies in Manipur, namely Kshetri Iril Youth Club Football Club (KIYC FC), Kshetrigao, Imphal East; Sang-gai Football School, Yaripok, Imphal East; Toubul Youth Development Association (TYDA), Bishnupur District; and Athletic Brother's Association (ABA), Kshetrigao, Imphal East. The participants were randomly assigned to four groups of 30 players each, comprising three experimental groups and one control group. The experimental groups participated in their respective training programmes for 12 weeks, six days per week, while the control group continued its regular activities without the prescribed experimental intervention. Before the commencement of the intervention, the participants' health status and physical capacity were examined by a medical practitioner. Data on selected motor abilities, including speed, agility, and explosive strength, were collected before and after the training period. The collected data were statistically analysed using paired t-tests to assess within-group changes, analysis of covariance (ANCOVA) to compare adjusted post-test means, and Bonferroni post hoc tests to identify significant differences between pairs of groups. The level of significance was set at 0.05. The findings revealed statistically significant pre-test to post-test improvements in speed, agility, and explosive strength among all three experimental groups, whereas the changes in the control group were not statistically significant. The ANCOVA results indicated significant differences among the four groups in speed ($F = 65.87$), agility ($F = 3.83$), and explosive strength ($F = 203.29$), all significant at the 0.05 level. The Bonferroni post hoc comparisons further indicated that the KIYC group demonstrated significantly better adjusted post-test performance than the other groups in speed and explosive strength. For agility, a significant difference was observed between the KIYC and control groups, while the remaining pairwise comparisons were not statistically significant. The findings suggest that the selected training programmes contributed to the development of important motor abilities among youth football players of Manipur, with the KIYC group demonstrating comparatively favourable outcomes in the variables examined. The study highlights the importance of systematic and structured training in enhancing the physical capacities required for football performance.

Keywords: Selected training programme, youth football players, Manipur, motor abilities, speed, agility, explosive strength, ANCOVA.

INTRODUCTION

Football is one of the most popular sports in the world and requires a combination of physical fitness, technical skills, tactical understanding, and psychological preparedness. Successful performance in football depends not

only on the players' technical abilities but also on their motor abilities, which play a significant role in executing various movements during training and competition. Among these abilities, speed, agility, and explosive strength are particularly important because football players must accelerate quickly, change direction rapidly, maintain balance, and generate force during sprinting, jumping, tackling, and kicking.

Speed enables players to move rapidly across the playing field, reach the ball before opponents, and create or prevent scoring opportunities. Agility helps players change direction efficiently in response to opponents and changing match situations. Explosive strength contributes to powerful movements such as jumping, sprinting, and kicking. These motor abilities are interrelated and influence the overall physical performance of football players. Therefore, the systematic development of these abilities is an essential component of effective football training, particularly during adolescence, when young players are developing their physical capacities and sport-specific performance.

A well-planned training programme can improve motor abilities through appropriate exercise selection, training intensity, frequency, duration, and progressive loading. However, the effectiveness of a training programme may vary according to the players' age, initial fitness level, training experience, and the nature of the exercises performed. Consequently, scientific investigation is necessary to determine the extent to which selected training programmes contribute to improvements in the motor abilities of young football players. Evaluating these changes through pre-test and post-test assessments can provide useful information for coaches, physical education teachers, and sports training professionals.

In Manipur, football has a strong sporting presence, and young players participate in various clubs and football training centres to develop their abilities. Nevertheless, systematic evaluation of structured training programmes is important to understand their effectiveness in improving specific motor abilities among youth football players in the region. Evidence obtained from such research may help coaches design more appropriate training practices and support the scientific development of young football talent.

Therefore, the present study, entitled "Effect of Selected Training Programme on Motor Abilities of Youth Football Players of Manipur," was undertaken to examine the effect of selected training programmes on the speed, agility, and explosive strength of youth football players aged 14–18 years. The study compared pre-test and post-test performance among three experimental groups and a control group over a period of 12 weeks. The findings are intended to contribute to a better understanding of the role of structured training in developing motor abilities and to provide practical guidance for improving training practices among youth football players in Manipur.

METHODOLOGY

This chapter describes the sources of data, selection of subjects, sampling procedure, criterion measures, selection and administration of tests, data collection procedures, and statistical techniques employed in the study.

Sources of Data

The data for the present study were collected from male youth football players aged 14–18 years who were undergoing regular football coaching at selected football academies and clubs in Manipur.

Selection of Subjects

A total of 120 male youth football players aged 14–18 years were selected as participants for the study. All participants were actively involved in regular football training at the selected academies and clubs in Manipur.

Selection of Sample

The participants were selected through purposive sampling based on the predetermined inclusion criteria of the study. The selected 120 players were assigned to four groups, comprising three experimental groups and one control group, with 30 participants in each group.

The participants were drawn from the following football academies and clubs:

1. Kshetri Iril Youth Club Football Club (KIYC FC), Kshetrigao, Imphal East, Manipur: Experimental Group I.
2. Sang-gai Football School, Yaripok, Imphal East, Manipur: Experimental Group II.
3. Toubul Youth Development Association (TYDA), Bishnupur District, Manipur: Experimental Group III.
4. Athletic Brothers' Association (ABA), Kshetrigao, Imphal East, Manipur: Control Group.

The three experimental groups underwent the prescribed football-specific training programme for 12 weeks, whereas the control group continued its regular football training activities without participating in the experimental intervention.

Selection of Variables

Dependent snd Independent Variables

Independent variables	
Specific football training	
Dependent variables	
	Motor fitness component
1	Speed
2	Agility
3	Explosive Strength

Selection of the Test

Selected Motor fitness variables			
1	Speed	50m Dash	In Second
2	Agility	Illinois test	In second
3	Explosive strength	Standing broad jump	In second

To determine the statistical significance of the differences between pre-test and post-test scores, paired-samples *t*-tests were applied. Analysis of covariance (ANCOVA) was used to compare the adjusted post-test means of the experimental and control groups. When the ANCOVA results indicated statistically significant differences, Bonferroni-adjusted post hoc tests were employed to identify significant differences between pairs of groups. The level of statistical significance was set at 0.05.

TRAINING INTERVENTION STRUCTURE AND PROGRESSION

Table 1. Structure of the Training Session

Training component	**Duration**
Warm-up and mobility exercises	10 minutes
Speed, agility and explosive strength exercises	40 minutes
Cool-down and recovery	10 minutes
Total	**60 minutes**

Table 2. Weekly Distribution of Training Activities

Day	Training emphasis	Training activities
Monday	Speed and explosive strength	Acceleration sprints and jumping exercises
Tuesday	Agility and speed	Zig-zag runs, shuttle runs and sprint drills
Wednesday	Explosive strength	Squat jumps, standing broad jumps and bounding
Thursday	Speed and agility	Sprinting and change-of-direction drills
Friday	Explosive strength and speed	Jumping exercises and acceleration runs
Saturday	Combined motor abilities	Integrated speed, agility and explosive strength exercises
Sunday	Recovery	Rest

Table 3. Phases of the 12-Week Training Intervention

Training phase	Duration	Training emphasis
Phase I: General Preparation	Weeks 1–3	Fundamental speed, agility and explosive strength development
Phase II: Development	Weeks 4–6	Progressive improvement in acceleration, change of direction and jumping ability
Phase III: Specific Development	Weeks 7–9	Higher-demand sprinting, agility and explosive movement activities
Phase IV: Performance	Weeks 10–12	Consolidation of motor performance through progressively structured training loads

Table 4. Progression of Training Intensity

Training phase	Weeks	Planned intensity	Work–rest ratio
Foundation	1–3	60–70%	1:02
Development	4–6	70–80%	1:02
Specific	7–9	80–90%	01:01.5
Performance	10–11	85–95%	1:1–1:1.5
Taper	12	70–85%	1:02

Description of the Training Intervention

The intervention was designed to provide progressive training stimuli for the development of speed, agility and explosive strength. The training programme was structured over a period of 12 weeks, with a planned progression in training intensity across the different phases. Each training session comprised a 10-minute warm-up and mobility component, 40 minutes of speed, agility and explosive strength exercises, and a 10-minute cool-down and recovery component. The same training protocol was implemented across all three experimental groups to maintain consistency in the intervention.

RESULT OF THE STUDY

After the collection of data, a t-test was used to examine the significance of differences between the pre-test and post-test scores of the four groups. The results are presented below

Motor Abilities

1: Analysis of Speed

The descriptive analysis shows means, standard deviation, percentage of improvement, mean differences and ‘t’ ratio of the collected data on Speed among experimental and control groups are presented in Table I(a).

Table – I (a)

Descriptive Analysis of the data on Speed of Experimental and Control Groups

(Unit of Measurement - Seconds)

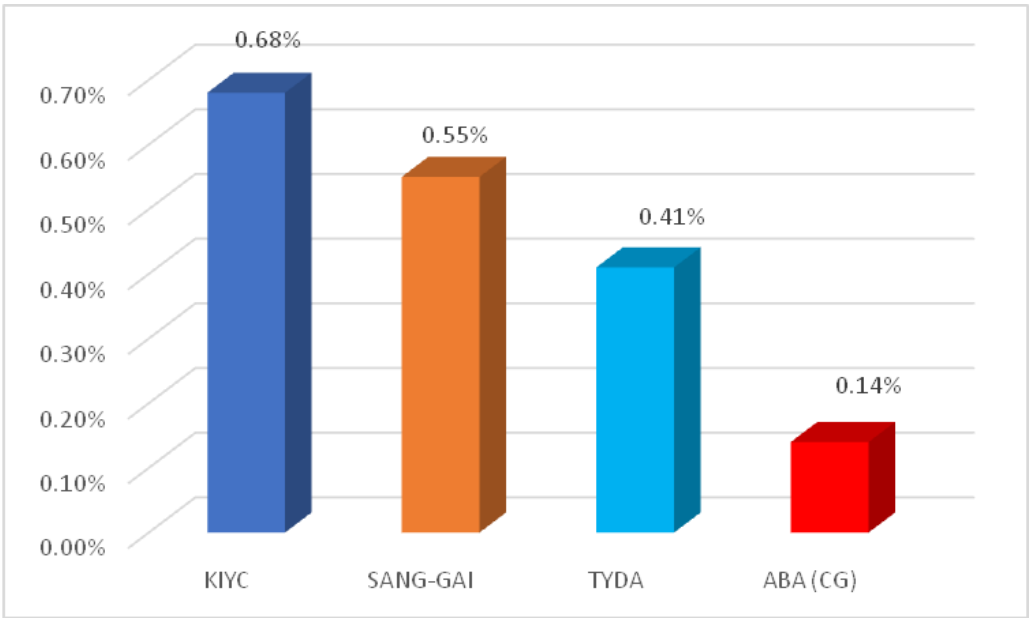
	Pre-test		Post-test			% of changes	
Training	**Mean**	**S.D**	**Mean**	**S.D**	**M.D**		**'t' ratio**
KIYC	7.33	0.31	7.28	0.31	0.05	0.68%	20.75*
SANG-GAI	7.3	0.34	7.26	0.34	0.04	0.55%	36.74*
TYDA	7.24	0.42	7.21	0.42	0.03	0.41%	9.73*
ABA (CG)	7.27	0.41	7.26	0.41	0.01	0.14%	1.96

Table t-ratio at 0.05 level of confidence for1 and 29 (df) = 2.045

The t-ratios for KIYC (20.75), SANG-GAI (36.74), and TYDA (9.73) exceeded the critical value of 2.045, indicating statistically significant improvements in speed. The ABA control group (1.96) showed no significant change. Speed decreased by 0.68% in KIYC, 0.55% in SANG-GAI, 0.41% in TYDA, and 0.14% in the control group. These percentage changes are presented in Figure I.

Figure – I

Diagram showing the Percentage of Changes on Speed of Experimental and Control groups



The data collected from the experimental and control groups on speed was statistically analysed by ANCOVA and the results are presented in Table I (b).

Table – I (b)

Analysis of Covariance on Speed of Experimental and Control groups

	KIYC	SANG-GAI	TYDA	ABA (CG)	SOV	SOS	df	M.S	f-ratio
Adjusted					**BG**	0.035	3	0.012	65.87*
Post-test	7.23	7.25	7.25	7.28					
Mean					**WG**	0.021	115	0	

**Significant at 0.05 level of confidence.*

(The table value required for significance with df 3 and 115 is 2.68)

ANCOVA revealed a significant difference among the adjusted post-test means of KIYC (7.23), SANG-GAI (7.25), TYDA (7.25), and ABA control (7.28), with an F-ratio of 65.87 (df = 3, 115), exceeding the critical value of 2.68 at the 0.05 level. This indicates a significant training effect after controlling for pre-test scores. Therefore, a post hoc test was conducted to identify pairwise differences in speed (Table I(c).

Table – I (c)

Post hoc Test for the differences among Adjusted Post-test Paired Means of Experimental and Control groups on Speed

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
KIYC	SANG-GAI	-.016*	0.003	0	-0.025	-0.006
	TYDA	-.021*	0.003	0	-0.03	-0.011
	ABA(CG)	-.048*	0.003	0	-0.057	-0.038
SANG-GAI	KIYC	.016*	0.003	0	0.006	0.025
	TYDA	-0.005	0.003	0.895	-0.014	0.004
	ABA(CG)	-.032*	0.003	0	-0.041	-0.023
TYDA	KIYC	.021*	0.003	0	0.011	0.03
	SANG-GAI	0.005	0.003	0.895	-0.004	0.014
	ABA(CG)	-.027*	0.003	0	-0.036	-0.018
ABA(CG)	KIYC	.048*	0.003	0	0.038	0.057
	SANG-GAI	.032*	0.003	0	0.023	0.041
	TYDA	.027*	0.003	0	0.018	0.036

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Bonferroni post hoc comparisons showed significant differences between KIYC and the other groups, and between SANG-GAI and TYDA and the ABA control group (all $p < .001$). However, the difference between SANG-GAI and TYDA was not significant ($p = .895$). KIYC recorded the lowest adjusted post-test mean, followed by SANG-GAI, TYDA, and ABA. If lower completion time indicates better speed, KIYC performed best, while all experimental groups outperformed the control group.

2: Analysis of Agility

The descriptive analysis shows means, standard deviation, percentage of improvement, mean differences and 't' ratio of the collected data on agility among experimental and control groups are presented in Table II (a).

Table – II (a)

Descriptive Analysis of the data on Agility of Experimental and Control Groups

(Unit of Measurement – Seconds)

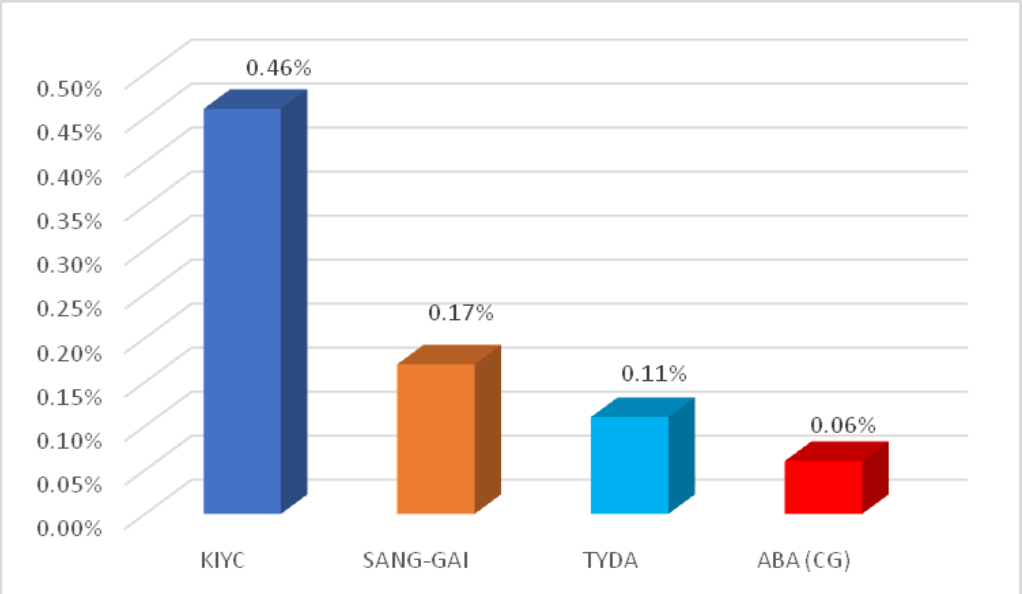
	Pre-test		Post-test			% of changes	
Training	**Mean**	**S.D**	**Mean**	**S.D**	**M.D**		**'t' ratio**
KIYC	17.27	1.05	17.19	1.05	0.08	0.46%	2.39*
SANG-GAI	17.43	0.99	17.4	0.99	0.03	0.17%	31.16*
TYDA	17.53	0.97	17.51	0.97	0.02	0.11%	23.34*
ABA (CG)	17.25	1.04	17.24	1.04	0.01	0.06%	1.24

Table t-ratio at 0.05 level of confidence for1 and 29 (df) = 2.045

The t-ratios for KIYC (2.39), SANG-GAI (31.16), and TYDA (23.34) indicated significant improvements in agility, while ABA control (1.24) showed no significant change. Agility completion time decreased by 0.46% in KIYC, 0.17% in SANG-GAI, 0.11% in TYDA, and 0.06% in the control group. These percentage changes are presented in Figure II.

Figure – II

Diagram showing the Percentage of Changes on Agility of Experimental and Control groups



The data collected from the experimental and control groups on agility was statistically analysed by ANCOVA and the results are presented in Table I (e).

Table – II (b)

Analysis of Covariance on Agility of Experimental and Control groups

	KIYC	SANG-GAI	TYDA	ABA (CG)	SOV	SOS	df	M.S	f-ratio
Adjusted					**BG**	0.098	3	0.033	3.83*
Post-test	17.29	17.34	17.35	17.37					
Mean					**WG**	0.978	115	0.009	

*****Significant at 0.05 level of confidence.*

(The table value required for significance with df 3 and 115 is 2.68)

ANCOVA revealed a significant difference in adjusted post-test agility scores among KIYC (17.29), SANG-GAI (17.34), TYDA (17.35), and ABA control (17.37), with an F-ratio of 3.83, exceeding the critical value of 2.68 at the 0.05 significance level. Therefore, a post hoc test was conducted to identify pairwise differences in agility performance Table II (c).

Table – II (c)

Post hoc Test for the differences among Adjusted Post-test Paired Means of Experimental and Control groups on Agility

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
KIYC	SANG-GAI	-0.048	0.024	0.274	-0.112	0.016
	TYDA	-0.057	0.024	0.115	-0.121	0.007
	ABA (CG)	-.078*	0.024	0.008	-0.142	-0.014
SANG-GAI	KIYC	0.048	0.024	0.274	-0.016	0.112
	TYDA	-0.009	0.024	1	-0.073	0.055
	ABA	-0.03	0.024	1	-0.094	0.034
TYDA	KIYC	0.057	0.024	0.115	-0.007	0.121
	SANG-GAI	0.009	0.024	1	-0.055	0.073
	ABA (CG)	-0.021	0.024	1	-0.085	0.043
ABA (CG)	KIYC	.078*	0.024	0.008	0.014	0.142
	SANG-GAI	0.03	0.024	1	-0.034	0.094
	TYDA	0.021	0.024	1	-0.043	0.085

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

Bonferroni post hoc analysis revealed a significant difference only between KIYC and the ABA control group (mean difference = −0.078, p = .008), favouring KIYC in agility performance. All other pairwise comparisons were statistically non-significant (p > .05). Thus, only the KIYC intervention showed a significantly greater improvement in agility than the control group.

3: Analysis of Explosive Strength

The descriptive analysis shows means, standard deviation, percentage of improvement, mean differences and 't' ratio of the collected data on explosive strength among experimental and control groups are presented in Table III (a).

Table – III (a)

Descriptive Analysis of the data on Explosive Strength of Experimental and Control Groups

(Unit of Measurement – Meters)

	Pre-test		**Post-test**			**% of changes**	
Training	**Mean**	**S.D**	**Mean**	**S.D**	**M.D**		**'t' ratio**
KIYC	2.4	0.2	2.45	0.2	0.05	2.08%	29.62*

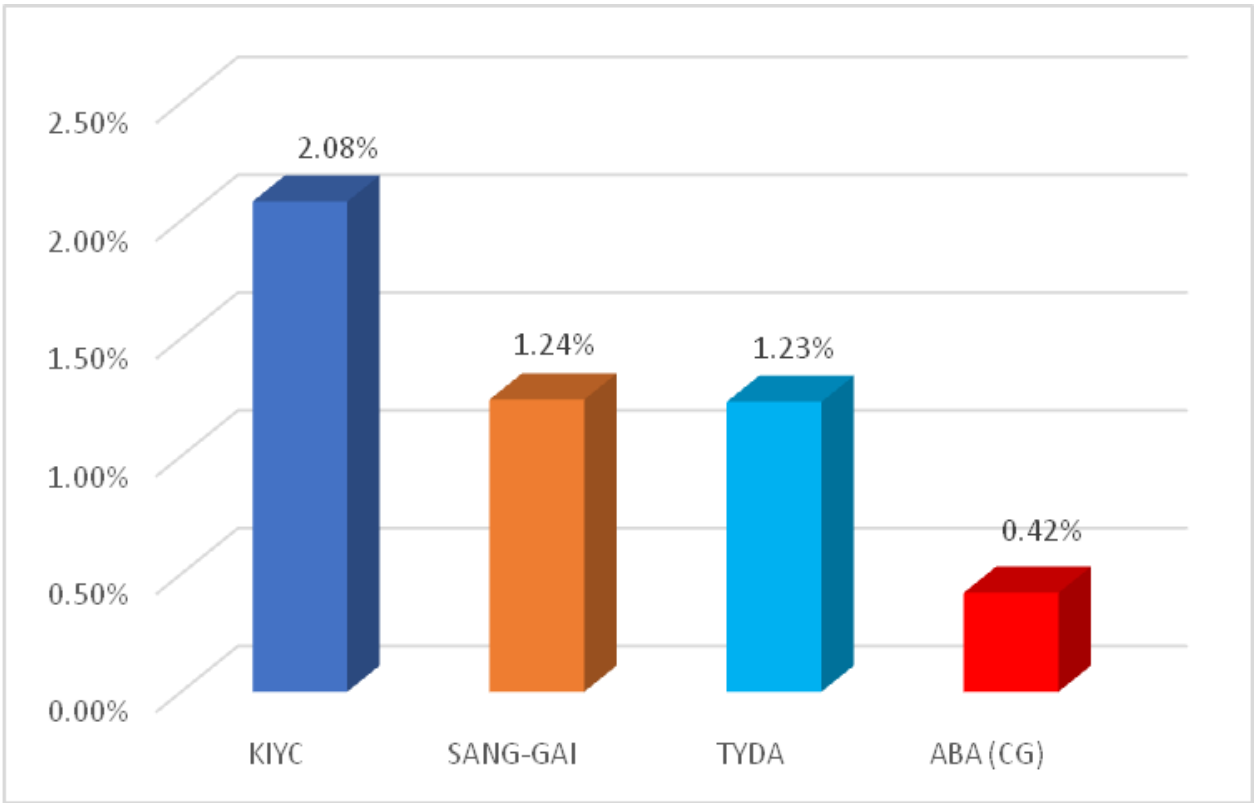
SANG-GAI	2.41	0.23	2.44	0.23	0.03	1.24%	30.33*
TYDA	2.43	0.2	2.46	0.2	0.03	1.23%	26.44*
ABA (CG)	2.4	0.18	2.41	0.18	0.01	0.42%	1.04

Table t-ratio at 0.05 level of confidence for1 and 29 (df) = 2.045

The t-ratios for KIYC (29.62), SANG-GAI (30.33), and TYDA (26.44) indicated significant improvements in explosive strength, whereas ABA control (1.04) showed no significant change. Explosive strength increased by 2.08% in KIYC, 1.24% in SANG-GAI, 1.23% in TYDA, and 0.42% in the control group. These percentage changes are presented in Figure III.

Figure – III

Diagram showing the Percentage of Changes on Explosive Strength of Experimental and Control groups



The data collected from the experimental and control groups on explosive strength was statistically analysed by ANCOVA and the results are presented in Table IV (h).

Table – III (b)

Analysis of Covariance on Explosive Strength of Experimental and Control groups

	KIYC	**SANG-GAI**	**TYDA**	**ABA (CG)**	**SOV**	**SOS**	**df**	**M.S**	**f-ratio**
Adjusted					**BG**	0.029	3	0.1	203.29*
Post-test	2.46	2.44	2.44	2.41					
Mean					**WG**	0.005	115	4.75	

**Significant at 0.05 level of confidence.*

(The table value required for significance with df 3 and 115 is 2.68)

ANCOVA revealed a significant difference in adjusted post-test explosive strength among KIYC (2.46), SANG-GAI (2.44), TYDA (2.44), and ABA control (2.41), with an F-ratio of 203.29, exceeding the critical value of 2.68 at the 0.05 significance level. This indicates a significant effect of the training interventions. Therefore, a post hoc test was conducted to identify pairwise differences in explosive strength Table III (c).

Table – III (c)

Post hoc Test for the differences among Adjusted Post-test Paired Means of Experimental and Control groups on Explosive Strength

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
KIYC	SANG-GAI	.011*	0.002	0	0.006	0.016
	TYDA	.019*	0.002	0	0.015	0.024
	ABA	.042*	0.002	0	0.038	0.047
SANG-GAI	KIYC	-.011*	0.002	0	-0.016	-0.006
	TYDA	.008*	0.002	0	0.004	0.013
	ABA	.031*	0.002	0	0.027	0.036
TYDA	KIYC	-.019*	0.002	0	-0.024	-0.015
	SANG-GAI	-.008*	0.002	0	-0.013	-0.004
	ABA	.023*	0.002	0	0.018	0.028
ABA (CG)	KIYC	-.042*	0.002	0	-0.047	-0.038
	SANG-GAI	-.031*	0.002	0	-0.036	-0.027
	TYDA	-.023*	0.002	0	-0.028	-0.018

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

Bonferroni post hoc analysis revealed significant differences in explosive strength among all four groups ($p < .001$). KIYC showed the highest adjusted post-test mean, followed by SANG-GAI, TYDA, and ABA control. Thus, the groups ranked KIYC > SANG-GAI > TYDA > ABA, indicating that all three training interventions outperformed the control group.

DISCUSSION OF FINDINGS

The findings of the study revealed that the selected 12-week training programmes significantly improved speed, agility, and explosive strength among youth football players of Manipur. All three experimental groups KIYC, SANG-GAI, and TYDA showed statistically significant pre-test to post-test improvements, whereas the ABA control group showed no significant changes.

In terms of speed, ANCOVA revealed a significant difference among the four groups ($F = 65.87$, $p < .05$). Bonferroni post hoc analysis showed that KIYC performed significantly better than SANG-GAI, TYDA, and the control group, while the difference between SANG-GAI and TYDA was not significant.

For agility, a significant overall difference was observed among the groups ($F = 3.83$, $p < .05$). However, post hoc analysis revealed a significant difference only between KIYC and the ABA control group. The other

pairwise comparisons were not statistically significant, suggesting limited evidence of differences between the experimental training programmes for agility.

Regarding explosive strength, ANCOVA indicated a significant difference among the four groups ($F = 203.29$, $p < .05$). Bonferroni comparisons showed significant differences between all pairs of groups, with KIYC achieving the highest adjusted post-test mean, followed by SANG-GAI, TYDA, and the control group.

Overall, the findings suggest that systematic training programmes can contribute to the development of important motor abilities in youth football players. KIYC demonstrated comparatively favourable outcomes, particularly in speed and explosive strength. These results highlight the importance of structured and regular training in improving the physical performance of young football players.

CONCLUSION

The study concluded that the selected training programmes significantly improved speed, agility, and explosive strength among youth football players aged 14–18 years in Manipur. The control group did not show statistically significant changes in these motor abilities. KIYC demonstrated comparatively favourable outcomes in speed and explosive strength, while its agility performance was significantly better than that of the control group. These findings highlight the importance of structured and systematic training in developing the physical capacities required for football performance.

RECOMMENDATIONS

The following recommendations are proposed for training youth football players in Manipur and for further research:

1. Youth football coaches should implement systematically planned training programmes with clear objectives for developing specific motor abilities Training plans should be reviewed regularly to assess progress toward these objectives.

2. Training programmes should be adapted to players' age, biological maturity, current ability, and individual developmental needs rather than applying the same workload to every player.

3. Coaches should integrate physical conditioning with football-specific activities so that players can apply their motor abilities in situations involving ball control, opposition, and decision-making.

4. Training schedules should account for players' overall training and match demands, with regular review of workloads to support continued participation and long-term development.

5. Coaches should provide individualized feedback and modify activities to address players' specific strengths and weaknesses while maintaining an appropriate level of challenge.

6. Further research should include youth players from additional clubs and districts of Manipur and investigate other motor abilities and football skills to assess the wider applicability of the findings.

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