

Impact of Functional Training on Sprinting Performance of College Sports Majors

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Abstract: The purpose of this study was to explore the relationship between functional training and sprinting performance. The students majoring in physical education in colleges and universities are taken as the research object, An 8-week training experiment was carried out to compare the changes in FMS test and sprinting performance of the subjects before and after the experimental intervention. The results show that after the functional training intervention, all the test indicators of the subjects have been improved in different amplitude, which reflects the role of functional training in special sprinting training, proves the effectiveness of functional training in specific people, and provides a theoretical basis and realistic path for grassroots sprinting training.

Keywords: Functional training; Sprinting performance; Students majoring in physical education in colleges; Sprint training.

1. Introduction

At present with the advancing of technology in every field or industry, functional training methods is incorporated in various training regimes .In recent studies , researches in this endeavor have been directed towards advancing training techniques for optimal speed augmentation. Functional training can enhance core stability and support lower limb power that could refine the coordination of body movement at great length. Functional Training has become an essential part of China's fitness and sports training landscape (Mangona 2023).

The objective of this research is to ascertain the relationship between functional training and short distance runners in the field. Introducing, discussing, and synthesizing studies and research related to the aforementioned structure form the foundation of this study.

2. Background of the Study

From the late 20th century to the early 21st century, as fitness culture spread in Western countries, Functional Training began to receive widespread attention as a comprehensive and efficient exercise method. (Santos 2023) pointed out that functional training initially gained attention in the fields of physical therapy and rehabilitation and gradually gained acceptance in the sports and fitness community.

(Inoue 2023) highlighted that as the concept of functional training spreads widely, more professional teams and coaches are incorporating it into their daily training routines, not only to enhance athletic performance but also to ensure athletes' physical health and longevity. The purpose of this training method is to enhance individuals' physical abilities in real-life situations, improve their functionality, and enhance their movement efficiency according to (Joonas 2023).Likewise, (Xiao 2023) stated in his research that today, Functional Training is no longer limited to the realm of rehabilitation. It has been widely adopted in sports, fitness, and athletic training to enhance the performance of athletes and the

general population, reduce the risk of injuries, and improve the quality of daily life. (Zhang 2023) noted in his study that the origin of functional training can be traced back to the fields of physical therapy and rehabilitation. (Saeidi 2023) pointed out that Functional Training has had a profound impact on sports training and has been widely applied in various sports. (McDougle 2023) highlighted that traditional isolated muscle exercises often overly emphasize strengthening specific muscle groups, neglecting the overall kinetic chain and stability. Functional Training encompasses not only strength training but also aspects such as flexibility, balance, coordination, speed, and explosiveness, providing athletes with comprehensive skill improvement (Wu 2023). Functional Training makes athletes' movements more natural and fluid when simulating actions in actual competitions (Alvarenga 2023).

3. Statement of the Problem

This study determined the influence of training methods on the performance with the goal of proposing enhance training program training framework that can enhance the functional training level and sprint results of track and field athletes. Specifically, the study sought answer to the following questions:

3.1. What is the profile of the short distance runner athletes -respondents in terms of:

- 1 sex,
- 2 age,
- 3 years of training as athlete?

3.2. What is the assessment of the athletes-respondents on their level of Functional Movement Screen before their actual training with regard to:

- 1 squat (deep squat)
- 2 hurdle steps
- 3 linear lunge(in -line lunge)
- 4 shoulder flexibility (shoulder mobility)

- 5 active knee leg lift (active straight leg raises)
- 6 torso stable push-ups(trunk stability push-ups)
- 7 torso rotation stability (Rotary stability quadruped)

3.3. Is there significant difference in their level of Functional Movement Screen when their profile is taken as a test factor?

3.4. Is there a significant difference in the assessment of training experience before and after the actual training experience?

3.5. What is the result of the short distance running performance in terms of the following?

- 1 sprinting -100 m (sec)
- 2 Turn backs – 20 m (sec)
- 3 Standing long jump (m)
- 4 Sit forward (cm)

3.6. Is there significant relationship between respondents' Functional Movement Screen and the performance in short distance running experience ?

3.7. Based on the find of the study, what enhanced training program can be proposed?

4. Scope and Delimitations

This study involves the evaluation and analysis of the influence of FMS test on sprint speed, and provides an effective reference for improving the sprint performance and training level of college physical education students.The

study involved the performance of 48 volunteer student athletes of track and field. This research primarily focuses on data collected for the functional motion screening performance in athletic field as research venue and the performance of the athletes respondents in sprinting.

5. Methodology

5.1. Research Design

This study uses a experimental method using One-Group Pretest-Posttest Design. This design includes a pretest measure followed by a treatment and a posttest for a single group.The subjects used the same functional training regimen to reduce the interference of objective factors.

5.2. Research Instruments

The study employed survey checklist that recorded the Functional Movement Screen and physical fitness test data before and after the experiment to compare the differences before and after the training intervention.

5.3. Statistical Treatment of the Data

Quantitative data was performed statistically and processed using the following statistical tools:

1 Frequency and the percentage ratio: This was used to describe participant profiles by sex, age and years of training experience.

2 Mean: This was used to determine the level of functional training, athletic performance, etc.

3 Mann-Whitney U test: This tool was utilized for comparative analysis for non- parametric

4 Wicoxon signed rank test: This statistical tool was utilized to inform of their answers before and after variable to determine comparative results.

6. The Profile of the Respondents

Table 1. Demographic Profile of the Subjects

Demographic Profile	Categories	Frequency	Percentage
Sex	Male	48	100.00
	Female	0	0.00
	Total	48	100.00
Age	18-19 years old	18	37.50
	20-21 years old	30	62.50
	22 years old and above	0	0.00
	Total	48	100.00
Years of Experience as Athlete	1 year or less	0	0.00
	2-3 years	0	0.00
	4-5 years	30	62.50
	6 years and above	18	37.50
	Total	48	100.00

Table 1 presents a summary of the demographic information for a group of 48 male athletes who participated in a study or intervention program. The table is divided into three main demographic categories: Sex, Age, and Years of Experience as an Athlete.

Overall, the table shows a homogeneous group of experienced male athletes predominantly in their early twenties, all of whom have at least four years of experience in athletics. This uniformity in demographic factors can be beneficial in reducing variability in research related to athletic

performance and interventions.

7. Results

7.1. Difference in the Assessment of Training Experience before and after the actual training experience

Table 2 shows the results, these significant findings from the

Table 2. Difference in Functional Movement Screen Before and After the Interventio

Test	Wilcoxon Z-Value	P-Value	Decision/ Interpretation
Squat	-2.72	0.01	Significant/ Reject H ₀
Hurdle Step	-2.26	0.02	Significant/ Reject H ₀
Linear-Lunge	-4.98	0.00	Significant/ Reject H ₀
Shoulder Flexibility	-3.76	0.00	Significant/ Reject H ₀
Active Knee Leg Lift	-4.02	0.00	Significant/ Reject H ₀
Torso Stable Push Ups	-2.98	0.00	Significant/ Reject H ₀
Torso Rotation Stability	-4.43	0.00	Significant/ Reject H ₀

7.2. Result of the Sprinting Performance

Overall, Table 3 shows that after 8 weeks, there were improvements in all measured parameters of distance running performance. Not only did the means for sprinting speed, agility, power, and flexibility increase, but the standard deviations generally decreased, indicating a more uniform improvement among the group of athletes. This suggests that the training or intervention program was effective in enhancing athletic performance across multiple dimensions.

Table 3. Results of Sprinting Performance

Parameters	Week 1		Week 8	
	Mean	SD	Mean	SD
Sprinting – 100 meters (sec)	12.22	0.38	11.70	0.32
Turn Backs – 20 meters (sec)	8.16	0.32	7.66	0.21
Standing Long Jump (m)	2.56	0.11	2.78	0.10
Sit Forward (cm)	8.14	5.54	18.73	3.32

8. Conclusion

After 8 weeks of experimental intervention, all the test indicators were improved to varying degrees. Not only did the means for sprinting speed, agility, power, and flexibility increase, but the standard deviations generally decreased, indicating a more uniform improvement among the group of athletes. This suggests that the training or intervention program was effective in enhancing athletic performance across multiple dimensions. Now it can be said that, perhaps in this particular sample, the ability to perform these functional movements may not predict or directly influence short distance running performance as measured by the tests

Wilcoxon signed-rank tests provide strong evidence that the intervention program was effective in improving the functional movement screen of the athletes. The consistent rejection of the null hypothesis across all tests suggests that the improvements were due to the intervention and not just a product of random variation. This success underscores the value of the implemented program and offers a solid foundation for developing future training protocols.

in question. This information can be valuable for coaches and trainers to understand the distinct components of athletic performance. Perhaps, it may influence how they design their training programs, focusing on specificity of training for desired outcomes.

9. Recommendations

In addition to interventions that can improve performance, perhaps encouraging talk or psychological support can also have an impact on improving performance. A brief message might encourage or push a person to stick to a task. In addition, it is suggested that it is necessary to try larger participation experiments to promote the spirit of competition and thus increase the expected satisfactory results. At the same time, since there is no significant correlation between functional motor training and the experience of short-distance athletes, athletic coaches can be advised to revisit the design of their training programs tailored to each student-athlete's specific tasks, abilities, and sense of commitment to maximize the effectiveness of this initiative. We recommend that the Track coach, through the athletic Director, recommend the adoption of the proposed protocol to school principals to improve the effectiveness of functional training.

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