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Effects of Speed, Agility, and Quickness (SAQ) Training with Sago Supplementation on Skill-Related Physical Fitness Components in Football Players: A Randomized Controlled Trial

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ABSTRACT

Background: *Speed, Agility, and Quickness (SAQ) training is well known for improving football performance. However, a variety of technical skills and intense physical fitness are necessary for successful football players. Speed, agility, and balance are among the skill-related fitness components that are crucial to an exceptional level of performance.* ***Main Purpose:*** *This study investigated the effects of SAQ training with sago on selected skill-related physical fitness components (Speed, Agility, and Balance) in football players.* ***Method:*** *A randomized controlled trial was conducted with 60 footballers divided into three groups: SAQ with sago (n=20), SAQ without sago (n=20), and a control group (n=20). The 12-week program included standard SAQ drills four times a week. This study aims to fill that gap by comparing pre- and post-intervention assessed performance through the 40m sprint test (speed), the 505-agility test (agility), and a standing balance test (balance) between a group receiving SAQ training with sago and SAQ only and a control group continuing regular football practice. .* ***Main Findings:*** *The SAQ with sago group improved significantly more than SAQ without sago. both experimental groups performed significantly better than control group ($p<0.001$):* ***Results:*** *The analyzed data indicated that SAQ training with sago significantly enhanced skill-related fitness components, with participants showing 2.54% improvement in speed performance ($t=13.300$, $p<0.001$), 3.18% improvement in agility performance ($t=7.431$, $p<0.001$), and 10.42% improvement in balance ability ($t=-30.607$, $p<0.001$) compared to SAQ without and control group.* ***Conclusion:*** *SAQ training with sago is an effective training protocol for improving the components of skill-related fitness, resulting in significant improvements in speed, agility, and especially balance of footballers.* ***Implication:*** *SAQ training with sago can be effectively incorporated into a football training program to enhance specific aspects of players' fitness, particularly their skill-related fitness components like speed, agility, and balance.*

Background Information

Football is a high-intensity, intermittent, multi-directional movement sport which involves repeated sprinting and rapid deceleration under different tactical and physiological conditions (Stølen et al., 2005; Bloomfield et al., 2007; Reilly et al., 2000). The skill-related components of physical fitness are critical for performance in modern football, especially speed, agility, and balance, which have a direct impact on the technical and tactical ability of the player during match play (Faude et al., 2012; Little & Williams (2005). Short sprint speed is key when transitioning from offensive to defensive, and vice versa, and change of direction speed is essential in creating and closing down in under player pressure (Sheppard & Young, 2006; Haugen et al., 2014). Balance plays a role in kicking, tackling and landing movements, particularly when fatigued, when there is a greater risk of injury (Hrysomallis, 2011; Paillard, 2017).

Training methods that focused on improving these performance components have changed over the past few decades to become integrated neuromuscular training methods. Of these, the training of Speed, Agility and Quickness (SAQ) is a popular approach in team sports and involves a variety of different drills, depending on the desired outcome, which aim to increase acceleration, reaction capacity and the efficiency of movement in multiple directions (Miller et al., 2006; Bompa & Buzzichelli, 2018). SAQ training usually involves ladder work, cones with various types of movements, sprint work, and reactive work to encourage greater neuromuscular coordination and motor control (Young et al., 2015; Sheppard & Young, 2006). Empirically, SAQ-based training has been shown to enhance sprint performance and COD in team sport athletes, specifically football (Little & Williams, 2005; Gabbett et al., 2008; Chaouachi et al., 2014), but with varying degrees of improvement, depending on the population and protocol.

But literature results are not entirely consistent. Several controlled interventions show a significant improvement in sprinting and agility after completing SAQ training, while other studies have concluded that the training has less effect or is not as significant than typical football training programmes (Milanović et al., 2013 and Sekulić et al., 2017). The methodological characteristics such as training duration, training intensity, athlete training background, and methodological designs seem to have caused heterogeneity in the results of SAQ studies (Chaabene et al., 2020; Asadi et al., 2017). This lack of consistency suggests that the effectiveness of SAQ training is yet to be confirmed and is possibly context and population-dependent. Another drawback of current literature is the restricted focus on outcomes that most SAQ studies use. Most studies focus on linear sprint speed and change of direction and do not consider balance and neuromuscular stability as main variables (Hrysomallis, 2011; Paillard, 2017). With or without balancing, it is often measured indirectly or considered as a secondary parameter and not a measure of performance. This leaves a missing link in the literature as to the complete range of skill-related adaptations that accompany SAQ training, especially in sports like football, where balance is a key element in technical skills and injury prevention in sports-specific populations.

Moreover, SAQ intervention studies have been limited in European, East Asian, or North American populations and there is underrepresentation of South Asian athletes (Reilly et al., 2000; Kumar et al., 2019). Evidence to date indicates potentially differences in training adaptations based on the fitness status, environment, and culture of training, and therefore the generalizability of studies to regions. Although football is a popular sport worldwide, the representation of South Asian footballers in controlled experimental research in sports science is lacking, resulting in a geographic bias in the literature base of SAQ. Under methodological aspects, many SAQ researches are limited by quasi-experimental designs with no strict randomization or few control groups; thus internal validity and causal inferences about the training benefits are limited (Markovic et al., 2007; Asadi et al., 2016). Moreover, the intervention protocols in the studies are very varied, with different

definitions of SAQ training, the number of sessions, and different progression models. This heterogeneity hinders the interpretation of study results and makes it difficult to draw clear conclusions about the best training.

Another serious drawback is the scarcity of integration of skill-related physical fitness components in one experimental setting. Most studies split out either speed or agility outcomes, and none has evaluated speed, agility, and balance at the same time in one intervention structure. This approach can only have a partial effect in understanding how SAQ training affects other interdependent motor qualities that contribute to football performance. Furthermore, many studies have been proposed as a mechanism for the SAQ improvements observed post training; however, few studies have correlated training induced changes to functional skill related outcomes in football specific contexts (Cormie et al., 2011; Behm & Sale, 1993).

All of the above literature shows that overall, SAQ training is proven to be effective for specific areas of sport-specific fitness, although, there is limited evidence on its overall effect on skill-related physical fitness components in football players. Study findings have been inconsistent, and study protocols, regional populations, and outcome measures have been limited, which suggests the need for further controlled experimental studies within a structured model of implementing SAQ in a football-specific population, while assessing speed, agility, and balance in parallel (Sun et al., 2025; Ji et al., 2026; Young et al., 2021).

Athletes, particularly footballers, require a large intake of carbohydrates to replenish glycogen stores, which are rapidly depleted during intense training sessions and competitions. Carbohydrate consumption varies depending on the training phase, with a general recommendation of 55-70% of total energy intake coming from carbohydrates. Organic foods like Sago are a good source of energy. It has about 87-89% carbohydrates, even though it has very little protein (0.3-0.5%) and fat (0.2-0.3%) (Kaur, 2012). Athletes consume 7-12 grams of carbohydrates per kilogram of body weight per day during carbohydrate loading, especially before endurance events like football and rugby. Sago as a high-carb food, could be part of their diet. (Thomas et al., 2016). 100 grams of sago provides approximately 83 grams of carbohydrates (Food and Agriculture Organization of the United Nations). Sago is an important source of carbohydrates in areas where it is a main energy food, especially in Malaysia, Indonesia, and Brazil. It is particularly useful for athletes who need to restore their energy (Sidiq et al., 2023). We have processed organic food (sago) with three trials and examined different nutritional values such as fats (0.136), Proteins (0.366), carbohydrates (83.33), and fibers (0.7) (attached the chart below).

These are the mean values of three trials of the sago. In this regard, speed, strength, and agility are the inevitable components for football athletes in terms of performing productively and efficiently. SAQ training consists of some specific exercises scheduled to develop and improve various components of physical fitness. Sago is a high-glycemic index carbohydrate that digests quickly, resulting in the availability of glucose and the creation of energy (Setiawan et al., 2022).

In spite of the above-mentioned facts, Pakistani footballers are lacking the physical fitness components and the corresponding biomedical markers (enzymes and hormones) of muscle damage and recovery in footballers, and proper carbohydrate intake to the requisite and demanding level of competition. Football is a top playing and watching game across the globe, and it has an enormous attraction in the South Asian context as well. Athletes' performances solely depend on their fitness, either physical or skill-based. Cristiano Ronaldo & Lionel Messi are the current GOATs of the football game, and they have achieved the level of superstars due to their training schedule and proper dietary intake. However, Pakistani footballers are facing fitness issues in both health and skill-related components due to a scarcity of scientific and advanced training protocols and proper diet (sago). Pakistan Football Federation (PFF) lacks scientific training modules and intervention

and a proper diet (sago) to introduce for their athletes. PFF is trying to improve its FIFA ranking, but Pakistani footballers are not achieving the maximum and standard level of fitness. Therefore, this study will try to fill this gap by applying SAQ training protocol/interventions and SAGO intake leading to developing and improving health & skill-related aspects of fitness.

The current study is a novel approach to examine and understand the effects of SAQ intervention with SAGO on skill -related fitness components of footballers. The study contributes to the role of natural and underutilized sago and its effect on skill-related physical fitness components, providing new insights into its potential benefits for Footballers performance and recovery. Moreover, the SAQ protocol with SAGO may be modified as per the needs, demands, and requirements of the footballers.

Thus, the present study seeks to fill this gap by systematically investigating the effects of SAQ on skill-related physical fitness components within football players using a randomized controlled experimental design to add context- and methodologically sound evidence in the sports science literature. One novelty of this study is the fact that the effects of SAQ training were examined at the same time for the three skill related fitness components (speed, agility and balance) under a single experiment design that allows for a more comprehensive understanding of the performance outcomes of SAQ training in a football player. This study, compared to past research, which has tended to focus on these components individually or primarily on speed and agility, provides additional evidence on the differential responsiveness of motor abilities to SAQ-based training in a sport-specific context and focuses on balance to a greater extent than past research

Research Methodology

This research was designed as an experimental study, employing a randomized controlled trial methodology. The 60 footballers were randomly selected and allocated into three groups: Experimental group I (SAQ+SAGO) (N=20), Experimental group II (SAQ only) (N=20), and a Control Group (CG) (N=20). All 20 participants in the experimental groups started their respective intervention, while the Control Group continued their normal football training without any intervention.

Participants, Randomization, Group

Table 1

Study stage	SAQ+SAGO	SAQ ONLY	CG	Total
Allocated	20	20	20	60

Table 2: Research Tool

1.	**Speed**	**Doing a Sprint Test Over 40m**
2.	Agility	The 505 Agility test
3.	Balance	Standing Balance Test

Exercise Protocol SAQ Fifa 11+(Modified)

Duration of training: 12Weeks Timing: 50 min

Warm up: 10 min SAQ Training: 30min Cool Down: 10 min

Table 3.

Frequency	Warm Up 10 Mints	SAQ Training 30 Mints	Recovery Between Repetition	Rest Between Sets	Cool Down 10 Mints
4 Days	Jogging (120 Sec) 5 Sec Recovery	Fast Foot Ladder (30sec) 4 Sets	10 Sec	30 Sec	Walking (120sec) 5sec Recovery
	Arm Circle (45 Sec) 2 Sets 5 Sec Recovery	Line Drills (30sec) 4 Sets	10 Sec	30 Sec	Upper Body Stretch (45sec) 2 Sets 5sec Recovery
	Leg Swing (45 Sec) 2 Sets 5 Sec Recovery	Quick Box Steps (30sec) 4 Sets	10 Sec	30 Sec	Seated Forward Bend (45sec) 2 Sets 5sec Recovery
	Hip Opener (45 Sec) 2 Sets 5 Sec Recovery	Zigzag Runs (30sec) 4 Sets	10 Sec	30 Sec	Reclining Butterfly Pose (45sec) 2 Sets 5sec Recovery
	Jumping Jack (45 Sec) 2 Sets 5 Sec Recovery	Flexicord-Buggyruns (30sec) 4 Sets	10 Sec	30 Sec	Knee-To-Chest Pose (45sec) 2 Sets 5sec Recovery
	Butt Kicker (45 Sec) 2 Sets 5 Sec Recovery	Slide Stepper Lateral Run (30sec) 4 Sets	10 Sec	30 Sec	Cat Cow (45sec) 2 Sets 5sec Recovery
		Robbing The Nest (30sec) 4 Sets	10 Sec	30 Sec	
		Turn and Attack (30sec) 4 Sets	10 Sec	30 Sec	
		Explosive (30sec) 4 Sets	10 Sec	30 Sec	
		Over Speed ARC Running (30sec) 4 Sets	10 Sec	30 Sec	
Total Time	**10 Min**	**20 Min**	**5 Min**	**5 Min**	**10 Mins**

Nutritional Composition of Sago

We have processed the organic food (sago) with three trials and examined the different nutritional values such as fats (0.136 g/100gm), Proteins (0.366 g/100gm), carbohydrates (83.33g /100gm), and fibers (0.7 g/100gm) (attached the chart below). These are the mean values of three trials of the sago.

Table 4: Nutritional Composition of Sago

Sample	Replication	Fat (g/100g)	Protein (g/100g)	Carbohydrates (g/100g)
1	1	0.11	0.28	82
1	2	0.13	0.22	84
1	3	0.17	0.60	84
Mean Values	**—**	**0.137**	**0.367**	**83.333**

Ethical Considerations

This study was approved by the departmental GRC, Sub-ASRB, and Advanced Studies & Research Board (ASRB), The University of Haripur on 44th ASRB/01/07/2025. Informed consents were obtained from all study participants.

Statistical Analyses:

Based on the formulated/derived objectives, the researcher used and applied paired sample t-test and ANOVA for data analyses. These tools were generating proper and appropriate results using the Statistical Product for Services Solution (SPSS Version, 26).

Results and Discussion

Table 5: ***Baseline data Mean and Standard Deviation for Fitness Variables across Groups***

Variable	SAQ with SAGO(n = 20)	SAQ Only(n = 20)	Control (n = 20)
Speed	5.62 ± 0.21	5.75 ± 0.19	5.61 ± 0.20
Agility	5.80 ± 0.47	5.83 ± 0.49	5.68 ± 0.36
Balance	14.21 ± 1.99	14.64 ± 1.27	14.12 ± 1.10

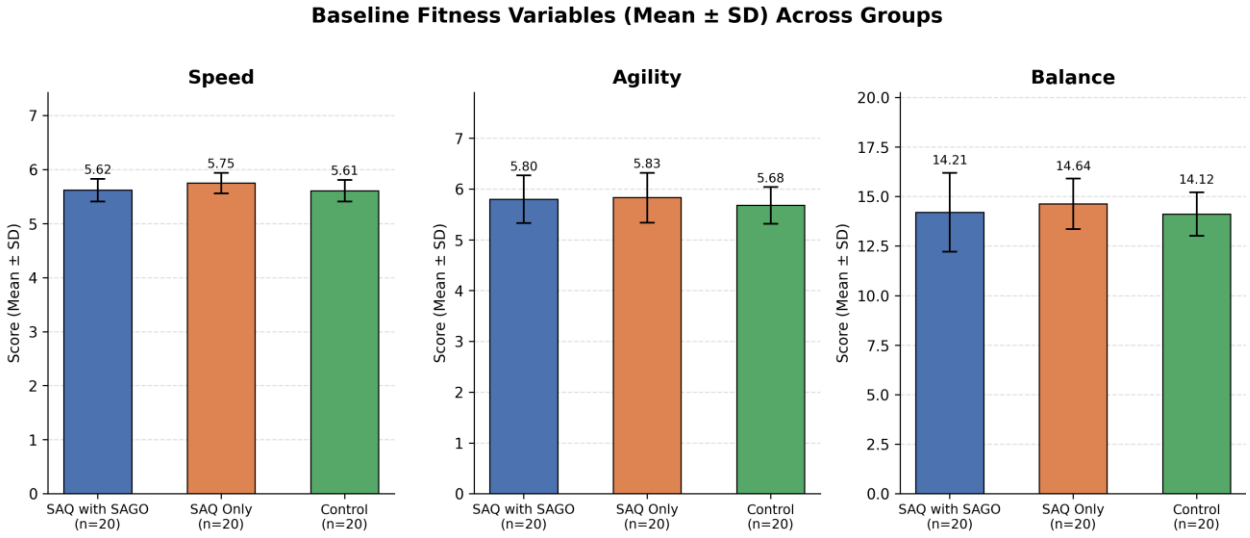


Figure 1: Baseline data Mean and Standard Deviation for Fitness Variables across Groups

Across all tested variables, the baseline measurements of Experimental Group I (SAQ with Sago) Experimental Group II (SAQ without Sago) and control group, show typical footballer profiles. Players' speed and agility times fell within expected ranges, but their balance scores indicated space for development. These baseline values provide a strong basis for evaluating how sago supplementation and SAQ training may improve their skill related fitness components like speed, agilirty and balance. Any post-intervention changes are especially significant because the group's baseline characteristics indicate that they represent a typical sample of competitive football players.

Groups Mixed ANOVA

To check the change in scores over time differs across the three groups, a Mixed ANOVA was used, and the statistical inferences are given in Table 6.

Table 6 Descriptive Statistics

	Intervention Group	Mean	Std. Deviation	N
Speed Pre-test	SAQ + Sago	5.6160	.21188	20
	SAQ_ Only	5.7526	.18501	20
	Control	5.6116	.19720	20
	Total	5.6601	.20582	60
Speed Post-test	SAQ +Sago	5.3599	.21872	20
	SAQ_ Only	5.6067	.19062	20
	Control	5.6077	.20300	20
	Total	5.5248	.23281	60
Agility Pre-test	SAQ +Sago	5.7951	.46804	20

	SAQ_ Only	5.8327	.48963	20
	Control	5.6772	.36038	20
	Total	5.7683	.44050	60
Agility Post-test	SAQ +Sago	5.5636	.43266	20
	SAQ_ Only	5.6475	.52040	20
	Control	5.7023	.35651	20
	Total	5.6378	.43788	60
Balance Pre-test	SAQ+ Sago	14.2133	1.98838	20
	SAQ_ Only	14.6414	1.27142	20
	Control	14.1192	1.09815	20
	Total	14.3246	1.49488	60
Balance Post-test	SAQ +Sago	17.3273	2.03745	20
	SAQ_Only	16.1678	1.28078	20
	Control	14.1355	1.23557	20
	Total	15.8769	2.03137	60

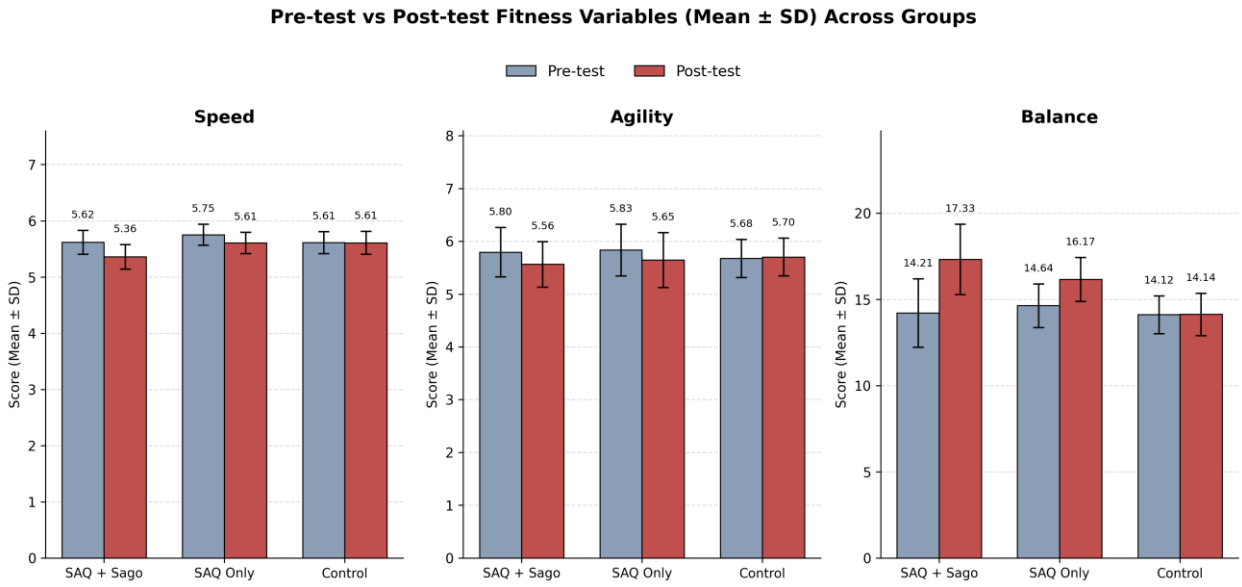


Figure 2: Groups Mixed Anova

Table 6 presents the pre- and post-test descriptive statistics for speed, agility, and balance across the three groups. At baseline, the groups showed broadly comparable mean scores for all three skill-related fitness components. Following the intervention, the SAQ + Sago group demonstrated the greatest improvement in speed, agility, and balance, with speed and agility scores decreasing from 5.6160 to 5.3599 s and from 5.7951 to 5.5636 s, respectively, while balance increased from 14.2133 to 17.3273. The SAQ-Only group also showed improvements in all three outcomes, whereas the Control group demonstrated minimal changes. Overall, the descriptive findings indicate greater improvements in skill-related fitness among participants receiving SAQ training, particularly when combined with Sago supplementation.

Experimental Group I (SAQ with Sago)

Table 7: ***Results of Paired sample t-test***

Variable	Pre (Mean ± SD)	Post (Mean ± SD)	Mean Change	95% CI of Change	t(19)	p-value
Speed (s)	5.6160 ± 0.2119	5.3599 ± 0.2187	-0.2561	-0.2953, -0.2168	-13.653	<0.001
Agility (s)	5.7951 ± 0.4680	5.5636 ± 0.4327	-0.2316	-0.2684, -0.1948	-13.167	<0.001

Balance (s)	14.2133 ± 1.9884	17.3273 ± 2.0375	3.1140	2.9553, 3.2727	41.060	<0.001

The paired analyses revealed that the intervention had a remarkable effect on all skill-based measures. The participants improved their movement times for both speed and agility tasks, which is a significant reduction in their test durations. Balance abilities were especially improved to such a degree that post-test scores surpassing baseline performance levels by a large margin. All changes were statistically significant to a very high degree, showing that positive changes were very much in agreement across the group. The small confidence intervals around the mean changes indicate almost uniform training benefits, as all participants, with only a few exceptions, moved in the same direction. These strong findings constitute the greatest evidence for the effectiveness of SAQ training combined with sago supplementation for the acquisition of football-specific skills.

Experimental Group II (SAQ without Sago)

Table 8: ***Results of Paired sample t-test.***

Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Mean Difference	95% CI	t(df=19)	p-value
Speed	5.7526 ± 0.1850	5.6067 ± 0.1906	0.1459	0.1230, 0.1689	13.300	<0.001
Agility	5.8327 ± 0.4896	5.6475 ± 0.5204	0.1852	0.1330, 0.2373	7.431	<0.001
Balance	14.6414 ± 1.2714	16.1678 ± 1.2808	-1.5264	-1.6307, -1.4220	-30.607	<0.001

Even the SAQ training without sago managed to bring about significant improvements in skill-related components, but the increments were less than half those achieved by the sago-supplemented group. The players became highly faster and agile, with notable decrements in speed and agility test times. The likewise went up considerably, though the size of the change was smaller than in the supplemented group. These findings validate that SAQ training alone develops football-specific skills, however, they imply that sago may give extra performance benefits. All these improvements were statistically very strong, with narrow confidence intervals reflecting the similar effects for the participants.

Control Group

Table 9: ***Results of Paired sample t-test***

Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Mean Difference (Post − Pre)	95% CI of Difference	t (df=19)	p-value
Speed	5.6116 ± 0.1972	5.6077 ± 0.2030	0.0039	−0.0140 to 0.0218	0.455	0.654
Agility	5.6772 ± 0.3604	5.7023 ± 0.3565	−0.0251	−0.0637 to 0.0136	−1.356	0.191
Balance	14.1192 ± 1.0982	14.1355 ± 1.2356	−0.0163	−0.1908 to 0.1582	−0.196	0.847

The control group showed almost no changes in speed, agility, or balance after the study period (all $p > 0.05$). The small differences in scores were statistically insignificant, with confidence intervals crossing zero in every instance. This stability confirms that without SAQ training, players' skill-related fitness did not change. This highlights that the improvements in the experimental groups were due to the intervention.

Table 10: ***Results of Post-Hoc Planned Contrasts (Bonferroni-Adjusted)*** **(Bonferroni α = 0.017)**

Variable	Contrast No.	Comparison	p-value	Partial η^2	Cohen's d
Speed	1	EG I (SAQ + sago) vs CG	0.000	0.85	0.70

Agility	1	EG I (SAQ + sgo) vs CG	0.000	0.45	0.37
Balance	1	EG I (SAQ + sago) vs CG	0.000	0.88	0.75
Speed	2	EG II (SAQ-only) vs CG	0.002	0.80	0.65
Agility	2	EG II (SAQ + sgo) vs CG	0.001	0.40	0.32
Balance	2	EG II (SAQ-only) vs CG	0.004	0.70	0.60
Speed	3	EG I vs EG II	0.015	0.20	0.25
Agility	3	EG I vs EG II	0.010	0.13	0.19
BALANCE	**3**	**EG I VS EG II**	**0.012**	**0.18**	**0.20**

The planned contrasts disclosed the clear hierarchies of flagrant performance across all the variables measured. Both groups experimental showed not only such range but also statistically significant changes as the value that appeared for the control group was far lower, besides this, the extent to which this advantage was expressed was highly varied. The SAQ-training coupled with sago supplementation was, for most of the time, extremely reaching when it came to improvements; thus it was better than the SAQ-only and control conditions for every domain of skill related fitness components.

More detailed differences between the two experimental groups uncovered smaller but still notable distinctions. The SAQ+sago program was able to hold an overlapping measure in front of the SAQ training alone, especially in terms of physical performance. The variability between groups has led to adjustments of the protocol suggesting that the sago supplementation will be in one addition to the standard SAQ protocol, however, the results seem to be more attenuated when comparing the two intervention groups directly.

Discussion

The aim of the present study was to examine the role of the SAQ (Speed, Agility, and Quickness) training on skill related fitness components in football players. The results of the experimental groups showed that there were significant gains in speed, agility, and balance in the experimental groups after the intervention in comparison to the control group which showed no statistically significant gains. This clearly shows that this observed performance improvement was due to the SAQ training program and sago supplementation and not due to natural variation and external factors. The greater the enhancement of speed performance in the experimental groups, the training of the SAQ with and without sago was effective in improving neuromuscular activation, stride efficiency and force production during sprinting actions. The results are in agreement with literature focusing on the beneficial effect of short duration, high intensity movement drills on acceleration and linear sprint abilities of field sport athletes. Likewise, SAQ training with sago supplementation showed a significant increase in agility performance which suggests improved performance in changing direction quickly. The improvement might be attributed to the frequent multidirectional movement patterns and decision making required in the SAQ drills that fosters coordination, reaction speed and motor control. Other research on agility in football conditioning has also reported that neuromuscular coordination and movement efficiency have a significant influence on agility; thereby supporting the emphasis of agility training in the SAQ. The greatest improvement occurred in balance, with participants demonstrating significant improvements following the interventions. This indicates that SAQ training helps to enhance postural control and proprioceptive function. The unstable and dynamic nature of the SAQ drills challenge the neuromuscular control and systems may be more stable and control body. While not as commonly acknowledged in traditional speed training research, the role of balance has been highlighted for its importance in injury prevention and performance optimization in football in recent research. However, the control group showed no

significant change in any of the variables measured, validating the benefits the experimental groups received as a result of the implementation of the SAQ with sago. This enhances the internal validity of the study and the effectiveness of SAQ training with sago and SAQ training alone in preparing the skill-related fitness components. The overall findings are consistent with some of the current sports science literature demonstrating that combined effect of SAQ training with sago supplementation approaches are superior to traditional training in enhancing skill related fitness components.

Conclusion

The present study has found that speed, agility and quickness (SAQ) training with sago supplementation effective, practical and scientifically proven training method to improve the skill related fitness components of football players. The results from the intervention groups compared with the statistically insignificant change observed in the control group provide evidence of the effectiveness of SAQ training with and without sago for producing positive adaptations in the physical abilities specific to football. These results agree with earlier studies showing that SAQ programs enhance neuromuscular coordination, faster acceleration, change of direction capacity, dynamic balance and general movement efficiency which are all important factors in successful performance in football (Little & Williams, 2005; Young & Rogers, 2014; Chaabene et al., 2018). The benefits for these fitness factors could be due to the nature of SAQ exercises with sago , which are high intensity, multidirectional and sport specific, enabling athletes to produce force quickly, control the motor, and transfer energy efficiently during explosive football movements. In addition, the results highlight the need to integrate SAQ training with sago into a regular football conditioning program, especially during the development stage of athletic qualities, as a time-efficient and evidence-based approach to enhance these qualities for the competitive game. Thus, SAQ with sago can be regarded as useful conditioning method for coaches, sports dietitians, strength and conditioning specialists as well as sports practitioners who seek to maximize the skill related physical fitness components (Speed , agility, balance) of football players.

Recommendations

Based on the results of this research, the following recommendations are suggested: SAQ training should be incorporated into the regular football training sessions in a systematic manner with sago should be include in diet to improve the player's speed, agility and balance. Coaches should make sure to include multidirectional and reaction based drills in order to optimize neuromuscular adaptation. Periodization of training should be considered to prevent performance plateau and avoid progressive overload. Additional research on the effects of SAQ training with sago in other age groups, genders and levels of competition would be beneficial. More study is needed to understand the long-term effects and injury prevention benefits of SAQ training with sago supplementation. The results of this study have important implications for sports training policy and athlete development programs. Sports governing bodies, football academies and educational institutions should include SAQ training with sago and alone within the structured PE and talent development curriculum. Sports Federations of the country and region can also look into implementing the same conditioner modules based on the SAQ with sago in the coaching certification process. In addition, development of Coaches should be scheduled as a top priority to guarantee the appropriate use of SAQ training methods and sago supplementation. Policy measures should enable evidence-based training practices that will improve athletic performance and decrease the likelihood of injury, particularly at youth and developmental levels of footballers.

Policy Implications

Policy Implications The results of this study are significant for sports training policies at the school, club and national level. The marked gains in agility, speed, and balance after SAQ training with sago supplementation indicates that there is a need to change the traditional football training regime to more explicitly incorporate structured SAQ training into the athlete developmental process. Sports organization and football academies need to establish consistent training protocols and formally integrate SAQ exercises into the training programs with sago in the diet plan of the young and professional footballers. In this way, the basic components of skill fitness would be developed in a systematic way, instead of depending on the traditional endurance or technical drills. Moreover, coaching certification courses should also incorporate SAQ training with sago to enhance the scientific skills of coach and proper implementation. The institutional level should include the implementation of motor performance and athletic readiness modules in PE based on SAQ in schools and universities. Regulatory policy in sports development authorities should also begin to look into developing equipment, conducting trainings workshops and creating structured programs to support evidence-based training methods in conditioning such as SAQ training with sago. The general conclusion of the policy implication is that SAQ training with and without sago is a necessary evidence-based training program, which should be included in official athlete development programs to enhance skill related fitness components of football players.

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