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EFFECTS OF AEROBICS DANCE, MENTAL VISUALIZATION, AND SKILL-SPECIFIC DRILLS ON AGILITY BETWEEN SCHOOL LEVEL BADMINTON ATHLETES

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Abstract
The objective of the research was to figure out the impact of aerobics dance, mental visualization, and skill-specific drills based on specified motor skill-related fitness variables (agility) among school-level badminton athletes. A total of eighty boys from the various schools from Chennai participated as the subjects for this study. The participants were chosen indiscriminately (simple random sample); they were assigned to four different groups, such as experimental groups I, II, and III and the non-treatment group. The study group I underwent aerobics dance (n=20); experimental group II underwent mental visualization (n=20); experimental group III underwent skill-specific drills (n=20); and group IV was the control group; they did not participate in any particular activity other than regular badminton training. The training program lasted for a period of 6 weeks, with 4 sessions per week. The dependent variable of the study was agility, and it was examined using the Illinois agility test. The following were the independent variables, such as aerobics dance, mental visualization, and skill-specific drills. In the experimental design, the pre-test and post-test selected group of control design was used. The pre- and post-data were obtained from 3 experimental groups along with the non-treatment group. Selected motor skill-related fitness variable agility had been statistically investigated by applying an analysis of co-variance (ANCOVA) to determine the substantial distinction between the groups. When the F value for the adjusted the was statistically significant, pairwise comparisons among means were conducted using Scheffé's post-hoc test, with the significance level fixed at 0.05 for hypothesis testing. The aerobics dance, mental visualization and skill-specific drills had considerably enhanced the experimental group participant's agility. The skill-specific drills had greatly outperformed than aerobics dance and mental visualization on the participants agility.

Keywords: Aerobics Dance, Mental Visualization, Skill-Specific Drills, Badminton, Agility.

Introduction
Globally, badminton is a popular net and racquet sport that people play both recreationally and competitively (BWF, 2023). It is well known for the nature of fast-paced agility and fitness; people of all ages and skill levels enjoy the sport (Phomsoupha & Laffaye, 2015). The sport is generally played in singles or doubles, where the purpose of the sport is to win points by hitting a shuttlecock over the net and into the opponent's court (BWF, 2023).

Badminton has a royal history that can be traced back from the ancient civilizations, but it attained significant appeal in the mid-19th century in British India (Grice, 2008). Today, it is an Olympic sport that is governed by the Badminton World Federation (BWF), which controls the rules, regulations, and smooth conduct of the sport (BWF, 2023).

The sport is the fast-paced rallies, highly demanding sport which needs to have hand-eye coordination, faster reflexes, and the ability to cover the court corner to corner efficiently (Lees, 2003; Phosoupha & Laffaye, 2015). A lightweight racquet is used to hit the shuttlecock, a feathered or synthetic projectile, above the net. The objective is to direct the shuttle land in the opponent's court while following the rules and regulations of the sport (BWF, 2023).

Agility is a fine and important motor skill-related fitness component in badminton, as it requires players to change multiple directions rapidly and react efficiently to the gameplay, and the rallies are unpredictable by nature (Sheppard & Young, 2006). Agility is essential for improving on-court performance in the game; enhanced agility is important in badminton, which demands sudden and fast footwork and rapid positional change (Phomsoupha & Laffaye, 2015). Aerobic dance has the outcome of being an effective training for developing cardiovascular endurance, coordination, and rhythmic movement, which results in better agility (Koutedakis & Jamurtas, 2004). Additionally, mental visualization, which is commonly termed as 'imagery training', serves a crucial function in skill acquisition and performance development by allowing players to cognitively rehearse gameplay, which results in improvement of reaction time and decision-making (Moran, 2012). Skill-specific drills, which improve the footwork patterns and game-like situations, are mostly implemented in badminton training to develop agility, movement efficiency, and badminton-specific performance (Lees, 2003). Therefore, the integration of aerobic dance, mental visualization, and skill-specific drills provides a comprehensive training approach to significantly improve agility among school-level boys' badminton athletes.

Methodology

The subjects of this study were eighty school badminton athletes from the Chennai district. The participants included in the study were randomly allocated into four groups of twenty (n=20) each (simple random sample), such as experimental groups I, II, III and non-treatment group. The participants in first group underwent aerobics dance (n=20), group II mental visualization (n=20), group III skill-specific drills (n=20), and group IV was the non-treatment group (n=20). Regular badminton training was provided to the control group; they did not participate in any other activity. The dependent variable examined in the research was agility, and the following were the independent variables chosen for the investigation: aerobics dance, mental visualization, and skill-specific drills. The pre-test and post-test randomized non-treatment group design was employed as the experimental approach. The data obtained from all four groups at pre- and post-intervention stages on the selected variables were analyzed statistically with covariance (ANCOVA). It was incorporated to bring out the statistically difference between the non-treatment group and the experimental group. The 'F' value for the adjusted scores was determined to be significant; the Scheffé's post hoc analysis was applied to determine pairwise mean differences. In the case, the significant was set at 0.05 for evaluating the hypothesis.

Training program

All four experimental groups undergone a structured training programme for a time period of 6 weeks and 4 days per week (90 minutes). Every training session followed a systematic format. At the commencement of the session, the participants engaged in 20 min of mental visualization, in which the cognitive practice of the aerobic movement and skill-specific drills were rehearsed for the day. This phase was followed by warmup for 15 minutes to prepare the body for the day's activity. Which was followed by 20 minutes of aerobic movement, which included progressive movement patterns such as marching, step-touch, side step, V-step, L-step, and grapevine, which gradually incorporated the complexity and intensity over the six-week period. After that, 20 minutes of skill-specific drills such as shadow practice, front, back and lateral movements, four-corner, cone drills, mirror drills, multi-shuttle, shuttle feeding and full-court drills. The training session concluded with 15 minutes of cool-down for better recovery.

The training schedule's level of intensity was incorporated as a progression of intervention, initially with 50% during the first two weeks, increasing to 55% in the second two weeks, and advancing up to 60% in the final two weeks.

The pre-test and post-test data on the dependent variable agility gathered across the four groups were subjected to statistically analysis to identify significant differences using the analysis of covariance (ANCOVA). When an 'F' ratio for the adjusted test was revealed to be significant for the adjusted post-test mean, Scheffé's test was performed as a post-hoc test to examine whether the paired mean differences were significant.

Table – I
Covariance analysis of pre- and post-test agility data

Test condition		CG	AD	MVT	SSD	SV	Sum of Squares	Degrees of Freedom	Mean Square	'F' value
Pre-test	Mean	17.82	17.94	17.72	17.64	B	1.92	3	0.64	1.75
	S.D.	0.28	0.35	0.26	0.221	W	39.13	76	0.33	
Post-test	Mean	17.66	16.94	16.72	15.64	B	15.39	3	5.45	12.77*
	S.D.	0.25	0.39	0.25	0.22	W	47.36	76	0.41	
Adjusted post-test	Mean	17.52	16.56	16.46	15.58	B	16.22	3	5.40	62.46*
						W	9.65	77	0.08	

*Significant at a confidence level of 0.05.
(The values in this table important for significance at the 0.05 level of confidence for 3 and 76 and 3 and 77 are 3.16).

Agility Result
The agility pre-test means and the standard deviation of CG, AD, MVT and SSD were 17.82 ± 0.28, 17.94 ± 0.35, 17.72 ± 0.26, and 17.64 ± 0.22, respectively, the acquired pre-test value F 1.75 was not more than the acquired table F value of 3.16. Hence, the means pre-test value of aerobics dance, mental visualization, skill-specific drills and the non-treatment group. The pre-test before starting the particular training was shown to be irrelevant at the 0.05 level of confidence for the freedom of degrees 3 and 76. Thus, the analysis verified that the random allocation of participants into four different groups was successful.

The mean and SD of post-test agility scores of the control group, aerobics dance group, mental visualization training group, and skill specific drill group were 17.66 ± 0.25, 16.72 ± 0.25, and 15.64 ± 0.22, respectively. The post-test F table value of 12.77 was not lesser than the necessary F value of 3.16. Thus, the post-test mean score of agility showed statistical significance at the 0.05 level with degrees of freedom of 3 and 76. Hence, the result acquired shows that the training, namely aerobics dance, mental visualization, skill specific drill training and non-treatment group on agility had a significant difference in improvement between the training groups.

The adjusted post-test means on agility scores of the control group, aerobics dance group, mental visualization training group, and skill specific drill group were 17.52, 16.56, 16.46, and 15.58, correspondingly. The acquired adjusted post-test value, F 62.46, was higher than the necessary table value, F of 3.16. Hence, the post-test F-test mean value of agility showed statically significant at the 0.05 level with degrees of freedom 3 and 77.

The final result of analysis of covariance indicates statistically significant difference between the selected three training groups and a non-training group on agility. In the process of finding out which intervention training program used in this research was the root for the significance of the adjusted mean, it was tested by Scheffé's post hoc test.

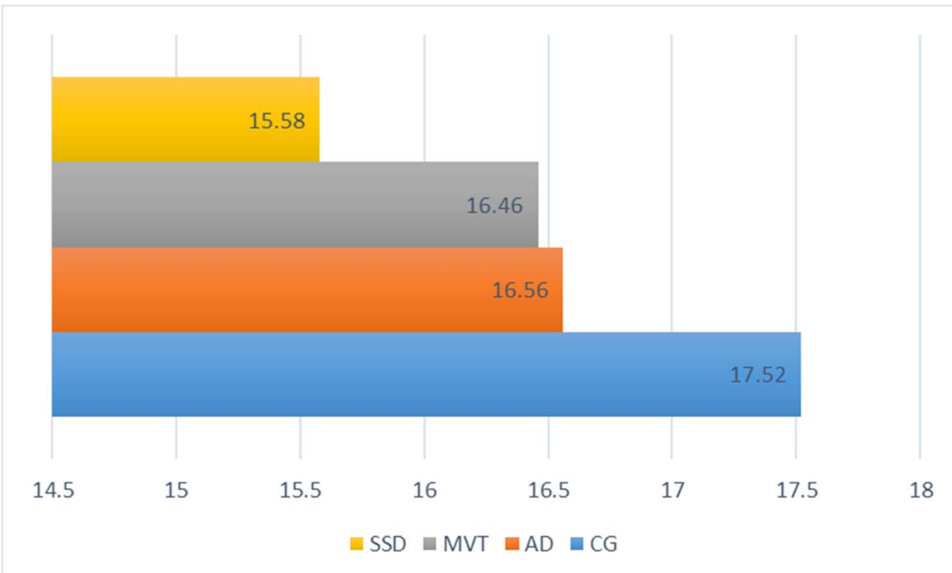

Figure - 1
Comparison of the mean on agility

Table II
Results of Scheffé's Post Hoc Test for Mean Differences in agility Among the four groups

CG	AD	MVT	SSD	Mean Differences	Confidence interval value
17.52	16.56			0.96*	0.138
17.52		16.46		1.06*	0.138
17.52			15.58	1.94*	0.138
	16.56	16.46		0.10	0.138
	16.56		15.58	0.98*	0.138
		16.46	15.58	0.88*	0.138

Significant at 0.05 level of confidence.

Result

Table II shows the group pairwise comparisons of groups on agility. The paired MD of group CG and AD, group CG and MVT, group CG and SSD, group AD and MVT, group AD and SSD, and group MVT and SSD were 0.96, 1.06, 1.94, 0.98, and 0.88 greater than the classified interval value of 0.138. Hence all 3 comparisons show the significant. The overall observations of the pairwise comparison indicate that, the given all 3-training proved better performance on agility compared with the non-training group. Above all, the skill specific drills outperform the best in agility, rather than other aerobics dance and mental visualization training.

Conclusion

The aerobics dance, mental visualization, and skill specific drill had significantly developed the athlete's agility. The skill specific drills had significantly outperformed aerobics dance and mental visualization training on the athlete's agility.

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