EFFECTS OF SPECIFIC CONDITIONING PROGRAM ON PHYSICAL FITNESS COMPONENT OF HANDBALL PLAYER

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Abstract: The present study was conducted to examine the effect of conditioning on the physical fitness of handball players from Hyderabad, Telangana, India. A total of 120 male players who had participated in intercollegiate and interuniversity competitions were selected for the study. Acceleration and speed were assessed using a 30-meter run, agility was evaluated through a shuttle run test, and cardiovascular endurance was measured using the Cooper 12-minute run/walk test. The data were analyzed using a t-test to compare pre- and post-test mean differences, while ANOVA was employed to examine differences both within and between groups. The results indicated that the conditioning program significantly improved acceleration and speed among the players. In particular, experimental group B showed a 1.30% improvement, with a t-value of -4.68 and a p-value of .000, indicating statistical significance. For agility, measured through the shuttle run, experimental group A demonstrated an improvement of 0.38%, with a t-value of 2.73 and a p-value of .009, which was also statistically significant compared to other groups. In terms of cardiovascular endurance, experimental group A exhibited the greatest improvement of 8.84%, with a t-value of -10.75 and $p < .001$, confirming a highly significant effect. The ANOVA results ($F = 4.859$, $p = .009$) further indicated that the changes within groups were statistically significant. Based on these findings, it can be concluded that conditioning exercises had a positive and statistically significant effect on key physical fitness variables, including acceleration and speed, agility, and cardiovascular endurance among handball players.
Key words: Conditioning, Cooper, Cardiovascular, Acceleration. ANOVA

Introduction

Physical fitness consists of two closely related aspects: general fitness, which refers to overall health and well-being, and specific fitness, which is concerned with the ability to perform particular tasks required in sports or occupational activities. In handball, physical fitness is crucial for effective performance, as the game involves continuous movement and rapid transitions between offensive and defensive play. Components such as acceleration, speed, and agility allow players to execute quick sprints during fast breaks, while aerobic endurance helps sustain performance throughout the match. Previous research has indicated that a high level of physical fitness enhances skill execution efficiency and reduces fatigue during competition (Bompa, 1999).

Handball is a dynamic and physically demanding team sport that requires a combination of physical fitness, technical skills, and tactical understanding. Players must repeatedly perform activities such as sprinting, jumping, quick directional changes, and throwing during gameplay. Therefore, developing key fitness components like acceleration, speed, endurance, and agility is essential for achieving optimal performance. In addition to physical abilities, players must possess strong technical skills, including dribbling, passing, and shooting, which are vital for success in the game. Well-structured and scientifically designed training programs are necessary to improve both physical fitness and sport-specific performance. According to Bompa (1999), systematic training methods enable athletes to progressively enhance their physical capabilities while also

refining their technical and tactical skills. Conditioning, often referred to as strength and conditioning, is a form of training aimed at improving an individual's overall physical capacity.The purpose of this study was to examine the effects of a conditioning exercise program on the physical fitness components of handball players in Hyderabad, Telangana.

Research Design

The study adopted an experimental design involving more than one group, commonly referred to as a paired or equated group design. Following the pre-test, the experimental groups received the treatment, which consisted of specific conditioning exercises conducted over a period of eight weeks. The third group, serving as the control group, did not receive any training intervention and continued with their usual activities.Initially, the researcher selected 120 male handball players from various degree colleges in Hyderabad. These participants included 40 intercollegiate players, 40 interuniversity players, and 40 individuals assigned to the control group. All participants were actively involved in training for intercollegiate and interuniversity competitions representing Osmania University and the state of Telangana. After obtaining informed consent, pre-tests were administered to assess selected physical fitness variables, including acceleration and speed, agility, and cardiovascular endurance.

The participants in the experimental groups (intercollegiate and interuniversity players) underwent a structured conditioning program five days per week for eight weeks. Each training session began with 10 to 15 minutes of appropriate warm-up exercises and concluded with 10 to 15 minutes of cool-down activities. During this period, the control group continued with their routine activities without any additional training. After completing the eight-week intervention, post-tests were conducted for all participants, and the data were recorded. The post-test results were then compared with the pre-test data using appropriate statistical methods, and the findings were discussed to draw conclusions.

Data were collected both before and after the intervention. Statistical analysis was carried out using descriptive and comparative methods, including the preparation of tables. The paired t-test was applied to determine whether there were significant differences in the mean values of the selected variables following the eight-week training program. Additionally, Analysis of Variance (ANOVA) was used to examine differences in variance between group means. The level of significance for all statistical tests was set at 0.05.

Table:1 Analysis of 30 m Run between experimental and control groups

Sl.No.	Name of the Group		Pre-test	Post test	MI %	t/sig	F/sig
1	Experimental group A	Mean	5.35	5.31		2.54	Pre 0.507/0.604
		Sd	0.52	0.55	0.75	0.015	
2	Experimental group B	Mean	5.38	5.31		4.68	
		Sd	0.43	0.43	1.30	0.000	Post 1.29/ 0.275
3	Control Group	Mean	5.46	5.47		-2.488	
		Sd	0.45	0.45	-0.18	0.02	

The findings of this study emphasized that conditioning intervention impact on acceleration and speed of handball players' had improved significantly which was aligns with prior research by B.Balakumar et.al (2026), E.Balaji et.al (2017). However experimental group B which treated with conditioning reported improvement in acceleration and speed performance (1.30%) and found t-value=-4.68,p-value=.000 statistically significant which was better than other groups. The F-value=1.295,p-value=.275, found that reduced variability between groups since more than 0.05 it remain statistically not significant difference in the post-test 30 m run performance.

Table: 2 Analysis of shuttle Run between experimental and control groups

Sl.No.	Name of the Group		Pre-test	Post test	MI %	t/sig	F/sig
1	Experimental group A	Mean	20.96	20.88		2.73	Pre 0.031/0.970
		Sd	0.59	0.61	0.38	0.009	
2	Experimental group B	Mean	20.95	20.94		0.600	
		Sd	0.54	0.54	0.04	0.552	Post 0.731/0.484
3	Control Group	Mean	20.98	21.03		-2.025	
		Sd	0.53	0.54	-0.23	0.05	

The impact of conditioning on agility, measured via the shuttle run. The Experimental A demonstrated a 0.38% and t-value=2.73,p-value=.009 was statistically significant than other groups. These findings align with prior research by Miodrag Spasic et.al (2015), S.Ramesh Kannan et.al (2014) The F-value=0.731,p-value=0.484. It indicates that changes within group were not significant.

Table:3 Analysis of Cooper 12 minutes run/walk test between experimental and control groups

Sl.No.	Name of the Group		Pre-test	Post test	MI %	t/sig	F/sig
1	Experimental group A	Mean	1700.38	1850.75		-10.75	Pre 0.193/0.825
		Sd	248.65	300.40	8.84	0.000	
2	Experimental group B	Mean	1725.25	1797.25		-6.30	
		Sd	146.32	176.44	4.17	0.000	Post 4.85/0.009
3	Control Group	Mean	1703.05	1693.63		1.785	
		Sd	165.05	168.89	-0.55	0.08	

These study results align with prior research by S.Rameshkannan(2024)and Dr.P.Madhusudhana Babu (2017) The experimental group A which followed conditioning demonstrated the greatest improvement than other groups in cardiovascular performance (8.84%). This change found t-value of –10.75, p<.001 was statistically significant. The F=4.859,p=.009. It indicates that changes within group were significant.

Conclusions

The researcher concludes that conditioning training had a significant positive impact on key physical fitness components, including acceleration and speed, agility, and cardiovascular endurance among handball players. The improvements observed within the groups clearly indicate that conditioning plays an important role in enhancing essential performance variables. Therefore, it can be concluded that a well-structured conditioning program is an effective approach for improving the overall physical performance of handball players.

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