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International Journal of Physical Education and Applied Exercise Sciences
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International Journal of Physical Education and Applied Exercise Sciences

Effect of Selected Yogic Asanas on Tennis Elbow

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Abstract

The aim of the present investigation was to determine effect of 12 weeks mayurasana, bakasana and utthita padmasana practices on tennis elbow of B.A. general students. The measuring technique of tennis elbow was by the active range of motion of elbow joints. Twenty female for experimental group and another 20 female for control group ages range (19 ± 2) years were selected for this study after measuring the range of motion of elbow joint. All measurements were performed using goniometer. The 3 selected asana in the treatment of tennis elbow was given for 1 hour fo 6 days in a week. One way ANOVA with bonferoni adjustment was used for calculation. The pre, mid and post test mean range of motion for elbow extension were 108.75+9.43, 102+11.22 and 99.01+10.51 in experimental group whereas in the control group were 105.28+12.31, 105.44+10.53 and 106.32+9.57 respectively. It may be concluded that selected yogic asana may decrease range of motion in elbow and cure tennis elbow significantly by strengthening the muscle strength.

Key Words: Asana-tennis elbow-range of motion.

Background:

In sports field Tennis Elbow remarkably affects the sports performance but no one take care for it in initial stage that's why it may keep away any body outside the sports arena for long time. There are various treatments to cure it. Yogic asana may be one of the alternative therapies without any side effect to completely cure from tennis elbow. Radial epicondylalgia is primarily detected by lateral elbow pain which is known as tennis elbow. It is normally measured by the range of motion of the elbow.

Review of Related Literature:

King M et. al. (2017) confirmed that off-longitudinal impacts below the longitudinal axis contribute to forced wrist flexion and eccentric stretch of the wrist extensors and there can be large differences in the amount of forced wrist flexion from individual to individual and between strokes with different impact locations. Shirato R et. al.(2015) established that simultaneous stretching of the wrist extensors by wrist, index and middle fingers flexion could provide stretching force to both the tendinous origins of the ECRB and EDC through the EDC-IF and EDC-MF. Olaussen M et. al.(2015) concluded that Acute lateral epicondylitis is a self-limiting condition where 3/4 of patients recover within 52 weeks. Physiotherapy with deep transverse friction massage, Mills

manipulation, stretching, and eccentric exercises showed no clear benefit, and corticosteroid injection gave no added effect. Corticosteroid injections combined with physiotherapy might be considered for patients needing a quick improvement, but intermediate (12 to 26 weeks) worsening of symptoms makes the treatment difficult to recommend. Tyler TF et. al.(2014) stated that chronic medial epicondylosis was markedly improved with the addition of an eccentric wrist flexor exercise to standard physical therapy. Given the inconsistent outcomes for patients previously treated with chronic medial epicondylosis the addition of isolated eccentrics seems warranted based on the results of this study. Shamsoddini A and Hollisaz MT (2013) stated that significant differences were found in wrist extension forces between effected and unaffected arms. Changes in grip strength showed statically significant improvements in the affected arm compared to the unaffected arm. Also, in assessment of pain at the lateral epicondyle, the mean change between affected and unaffected arms was significant. The taping technique, as applied in this study demonstrates an impressive effect on wrist extension force and grip strength of patients with TE. Elbow taping also reduces pain at the lateral aspect of tennis elbow in these patients. King MA et. al.(2012) found that during off-centre impacts below the longitudinal axis of the racquet, the wrist was forced to flex up to 16° more with up to six times more wrist extension torque when compared to a centre impact simulation. Perturbing grip tightness had no substantialeffect on centre impact simulations. However, for off-centre impacts (below the longitudinal axis of the racquet) a tight grip condition resulted in a substantial decrease in racquet rotation within the hand (less than 2°) and an increase of 6° in wrist flexion angle when compared to the equivalent simulation with a normal grip. In addition there was approximately 20% more wrist extension torque when compared with equivalent off-centre impact simulation with a normal grip. Consequently off-centre impacts below the longitudinal axis of the racquet may be a substantial contributing factor for tennis elbow injuries with a tight grip aggravating the effect due to high eccentric wrist extension torques and forced wrist flexion.

Method:

Twenty female for experimental group and another 20 female for control group with a mean age of (19 ± 2) years with sign of tennis elbow of general B.A. students of Seva Bharati Mahavidyalaya were selected. Diagnostic inclusion criteria for radial epicondylalgia were: a) typical history of lateral elbow pain b) tenderness at distinct palpation of the radial epicondyle of the humerus; and c) pain at the radial epicondyle when the elbow is actively moved from flexion to full extension with the forearm in pronation and the wrist in flexion. Students with a history of major trauma to the arms such as fracture were excluded. All students were right handed. Procedure The range of motion measurements were performed using a 17cm double arm goniometer with a semicircular scale (Upjohn, Partille, Sweden), frequently used in ordinary clinical practice. All measurements were performed by the same investigator at room temperature. The measurements were always executed in the same order according to the protocol. The active range of motion (maximal joint angle reached by the subject's own force) was registered. The investigator strived to apply the same pressure each time. All tests were performed at the same time of day. When executing the repeated tests, the investigator did not have the previous results available nor could the subject observe the readings. One registration for each actual joint angle was noted. Elbow extension was measured from a lateral view, the forearm in supination, and the palm of the hand upward. The goniometer arms were positioned parallel to the upper arm and forearm centrally. The value 0" described full neutral extension. Hyperextension was attributed positive values, while an extension defect was

attributed negative values. The tests were conducted before practicing asana, after completion of 6 weeks and after 12 weeks.

Statistical Analysis:

In this study the level of significance was determined at the 0.05 level by using one way repeated measure ANOVA by bonferoni adjustment and also the mean, standard deviation with percentage change ware calculated through SPSS.

RESULTS:

In this study the range of motion in elbow of the experimental group was decreased by 8.96% after 12 weeks of yogasana training (Fig. no. 1 and Table no.1).

Figure No. 1: Figure of Comparison Mean of Range of Motion of Elbow

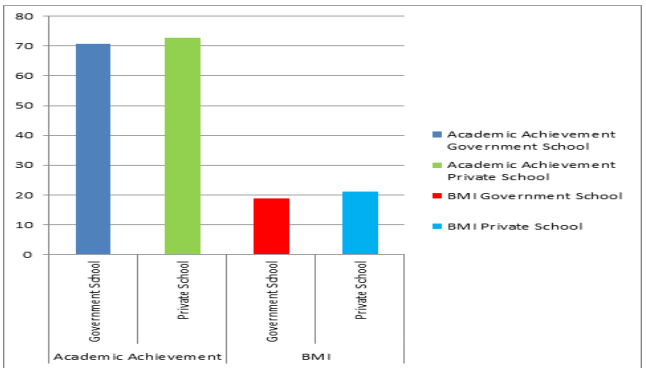

Table No. 1: Mean and Standard Deviation of Range of Motion of Elbow

Group	Pre test mean	Mid test mean	Post test mean
Ex.Gr.	108.75 + 9.43	102.30*** + 11.22	99.01*** + 10.51
Con. Gr.	105.28 + 12.31	105.44 + 10.53	106.78 + 9.57

DISCUSSION AND CONCLUSION:

A load effect, when performing repeated asanas on the same joint regularly and repeatedly the strength was increased. A search of the literature revealed a paucity of quality studies examining the efficacy of treatments for medial epicondyle tendinopathy. In two published systematic reviews attempting to examine treatment effectiveness of interventions for medial epipcondylosis their authors found no studies meeting their inclusion criteria.3,5 A combination of dry needling and ultrasound guided autologous blood injection has been shown to decrease pain measured by visual analog scale and modified Nirshl scores, but had a small a sample size of 20 similar to the current study. There is some evidence to suggest the use of low level laser therapy in the treatment of medial epicodylitis. Low level energy shock wave therapy for the treatment of chronic medial tendinopathy was found to offer poor results7 and there were long term benefits reported from a local injection of methylprednisolone. Given the inconsistent outcomes for patients previously treated with chronic medial epicondylosis the yogic therapy may elicited a positive impact on cure from tennis elbow.

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Comparative Effects of Mental and Ideo-Motor Training on "Tai O Toshi" Performance in Judo

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Abstract

The objective of the present study was to get the influence of mental training and ideo-motor training on "Tai O toshi" performance in Judo. There are ninety male national level judokas from Madhya Pradesh were selected as subjects for this study. The subjects were divided into three group's i.e. two experimental groups and one control group. Mental training & Ideo-Motor training were selected as independent variables & "Tai O toshi" performance in Judo was selected as dependent variable. Performance of "Tai O toshi" in Judo was measured by panel of three experts and score was given out of 30 points. The data were collected before the start of the experiment (pre-test) and at the end of the training period (post-test). For the study, pre-test post-test randomized group design, which consists of one control group (n=30) and two experimental groups (n=30 in each) was used. Equal numbers of subjects were assigned randomly to the groups. Two groups (Mental training group and Ideo-motor training group) served as experimental groups on which treatment was assigned and the third group served as the control group. In order to find out the effect of mental training and Ideo-motor training on learning "Tai O toshi" performance in Judo, analysis of Co-Variance (ANCOVA) was used. The level of significance was set at 0.05 level. Both the experimental treatments (Mental Training group & Ideo Motor Training Group) proved to be equally effective in learning "Tai O toshi". In case of treatments, 84.6 % (Partial Eta Squared = .846) in the total variance can be explained by treatment effect and remaining 15.4 % is unexplained.

Kew Words: Mental Training, Ideo-Motor Training & "Tai O toshi".

1. Introduction

The beginning of sports training should have in sight the development make-up of the learner. It is the prime need of all the physical activities that the learner should perform the movements quite accurately. It will also get judoka to be involved more if would come to know why particular activity should be executed by the way it is being performed. Sport should not be only physical aspect of his personality; it should be an integrated part of his personality, as the sports attitude. Using of mental training is useful facility to achieve psycho relation and also help the learner in learning his successful performance, which will lead to a useful change in psycho motor behavior. Mental training and ideo-motor training are supposed to reduce the high activation level and psycho physiological disequilibrium and also contribute to steadiness, psycho motor coordination and emotional stability.

2. Objective of the Study

The objective of the present study was to get the influence of mental training and ideo-motor

training on "Tai O toshi" performance in judo.

3. Methodology

3.1 Subjects

Ninety male national level judokas from Madhya Pradesh were selected as subjects for this study. The subjects were divided into three group's i.e. two experimental groups and one control group.

3.2 Variables

The study was taken on the basis of available Literature on Mental training, Ideo-Motor training and Judo. Keeping in the mind about specific purpose of the study, the following Variables were selected:

A: Independent Variables:

- Mental training
- Ideo-Motor training

B: Dependent Variable: "Tai O toshi" performance

3.3 Measures

Performance of the "Tai O toshi" was measured by panel of three experts and score was given out of 30
points.

3.4 Data Collection

The data were collected before the start of the experiment (pre-test) and at the end of the training period (post-test). Necessary instructions were given to the subjects before collecting data.

3.5 Design

For the study, pre-test and post-test randomized group design, which consists of one control group (n=30) and two experimental groups (n=30 in each) was used. Equal numbers of subjects were assigned randomly to the groups. Two groups (Mental training group and Ideo-motor training group) served as experimental groups on which treatment was assigned and the third group served as the control group.

Mental training Group	**O1**	**T1**	**O2**
Ideo-motor training Group	**O3**	**T2**	**O4**
Control Group	**O5**	**O6**	

3.6 Administration of Training Program

The experimental groups were imparted One hour of daily practice of mental training and Ideo-Motor training along with the regular training respectively for ten weeks under the proper supervision and guidance, while no practice was imparted to control group.

3.7 Statistical Technique for Analysis of Data

In order to find out the effect of mental training and Ideo-motor training on learning "Tai O toshi" performance in Judo, Analysis of Co-Variance (ANCOVA) was used. The level of significance was set at 0.05 level.

4. Findings

Testing Assumptions to apply ANCOVA

4.1 Assumption 1: Independence:

Score on both the dependent variable and covariate should be independent of those score for all other participants.

This Assumption relate to experimental design, and "Pre-Test and Post Test Randomized Group Design" of the present study fulfils the first assumption to apply ANCOVA.

4.2 Assumption 2: Linearity:

Linear relationship should exist between dependent variable and covariate for each group.

4.3 Assumption 3: Homogeneity of Regression Slopes:

variable and covariate in each group should be same.

Figure -I: Scatter Plots of Mental Training Group in Relation of "Tai O Toshi" Performance

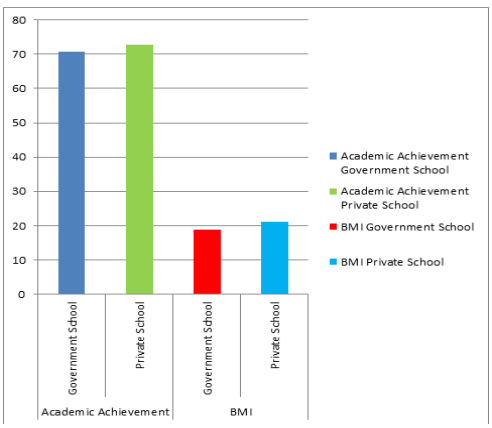
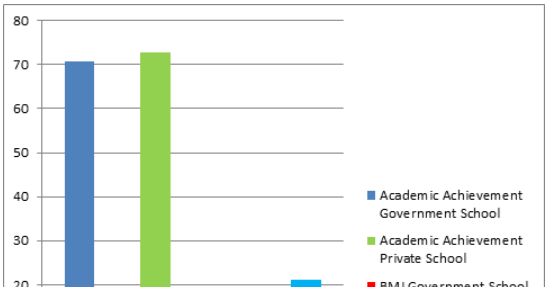


Figure-III: Scatter Plots of Control Group in Relation of Tai O Toshi Performance



In figure I, II & III, the scatter plots show a linear relationship between dependent variable (Post-Test) and Covariate (Pre-Test). The slope of regression line across all groups (Mental Training group, Ideo motor training group and Control group) shows a similar pattern. This fulfils the assumption 2lld and 3rd to apply ANCOVA

4.4 Assumption 4: Normality:

The dependent variables should be normally distributed with same score on the covariate and in the same group. In case scores for covariate alone are normally distributed, than ANOCVA is robust this assumption.

Table-I

Descriptive Statistics of Mental Training Group in Pre Test in relation of "Tai O toshi" Performance

Mean		**17.8333**	**.35585**
95% Confidence Interval for Mean	Lower Bound	17.1055	
	Upper Bound	18.5611	
5% Trimmed Mean		17.8148	
Media		18.000	
Variance		3.799	
Std. Deviation		1.94906	
Minimum		15.00	
Maximum		21.00	
Range		6.00	
Interquartile Rang		4.0	
Skewnes		.041	.42
Kurtosis		-1.321	.833

Figure-IV: Q-Q Plots for two Experimental Groups and Control Group in Pre-Test and Post-Post-Test

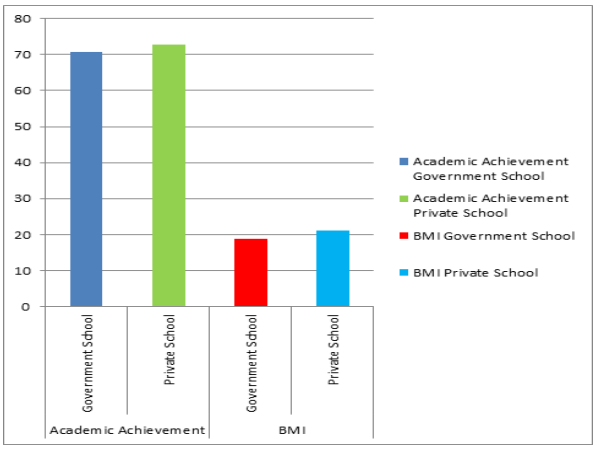


Figure-V : Histogram with Normal Curve for two Experimental Groups and Control Group n Pre-Test and Post-Test

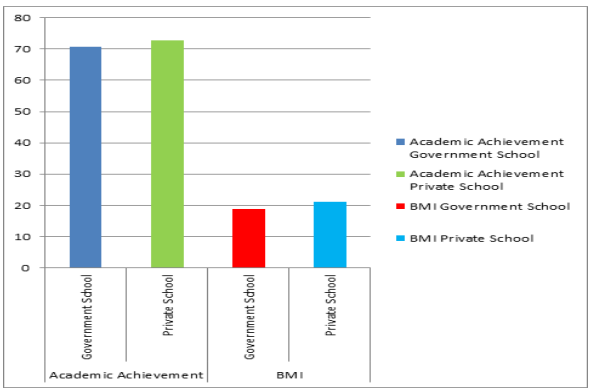


Table-VII Formal Tests to Test the Normality of Data

	Kolmogor-ov-Smirnov3			**Shapiro-Wilk**		
Groups	Sta-tistic	Df	Sig.	Statis-tic	Df	Sig.

Table-II

Descriptive Statistics of Mental Training Group in Post Test in Relation of of "Tai O Toshi" Performance

Mean		**20.100**	**.25975**
95% Confidence Interval for Mean	Lower Bound	19.5687	
	Upper Bound	20.6313	
5% Trimmed Mean		20.148	
Media		20.0000	
Variance		2.024	
Std. Deviation		1.42272	
Minimum		17.00	
Maximum		22.00	
Range		5.00	
Interquartile Rang		2.00	
Skewnes		-.419	.427
Kurtosis		-.76	.833

Table-III

Descriptive Statistics of Ideo Motor Training Group in Pre Test in Relation of of "Tai O Toshi" Performance

Mean		**17.8333**	**.36225**
95% Confidence Interval for Mean	Lower Bound	17.0924	
	Upper Bound	18.5742	
5% Trimmed Mean		17.8148	
Media		18,0000	
Variance		3.937	
Std. Deviation		1.98413	
Minimum		15.00	
Maximum		21.00	
Range		6.00	
Interquartile Rang		4.00	
Skewnes		.020	.427

Kurtosis	-1.425	.833

Table-IV

Descriptive Statistics of Ideo Motor Group in Post Test in Relation of of "Tai O Toshi" Performance

Mean		**20.333**	**.32282**
95% Confidence Interval for Mean	Lower Bound	19.6731	
	Upper Bound	20.9936	
5% Trimmed Mean		20.3148	
Media		20.0000	
Varianc		3.12	
Std. Deviation		1.76817	
Minimum		18.00	
Maximum		23.00	
Range		5.00	
Interquartile Rang		3.25	
Skewnes		-.025	.427
Kurtosis		-1.453	.833

Table-V

Descriptive Statistics of Control Group in Pre Test in Relation of of "Tai O Toshi" Performance

Mean		**17.6667**	**.35342**
95% Confidence Interval for Mean	Lower Bound	16.943	
	Upper Bound	18.3895	
5% Trimmed Mean		17.6296	
Media		17.5000	
Varianc		3.747	
Std. Deviation		1.93575	
Minimum		15.00	
Maximum		21.00	
Range		6.00	
Interquartile Rang		4.0	
Skewnes		.233	.427
Kurtosis		-1.258	.833

Table-VI
Descriptive Statistics of Control Group in Post Test in Relation of of "Tai O Toshi" Performance

Mean		**17.0667**	**.28338**
95% Confidence Interval for Mean	Lower Bound	16.4871	
	Upper Bound	17.6463	
5% Trimmed Mean		17.0185	
Media		17.0000	
Varianc		2.409	
Std. Deviation		1.55216	
Minimum		15.00	
Maximum		20.00	
Range		5.00	
Interquartile Rang		2.25	
Skewnes		.297	.427
Kurtosis		-.881	.833

In Table I to VI, when numerical value of "skewness" was compared with twice the "standard error skewness" and included the range from minus twice the standard error of skewness to plus twice the standard error of skewness, in most of the cases, the value for skewness lie within this range. This shows that data or degrees of skewness are not significantly skewed or skewness is considered not seriously violated.

The Same numerical process was used to check the normal distribution in relation to "kurtosis". Again a range of "normality" by multiplying the standard error of kurtosis by 2 was constructed from minus that value to plus that value. This distribution was also found significantly normal in terms of kurtosis.

Two formal tests named Kolmogorov- Smirnow test and Shapiro-Wilk tests were also applied to conform normality of data.

The descriptive statistics (Table I to VI), Q-Q Plots (Figure IV), Histogram with normal curve (Figure-V) and formal tests (Table-VII) prove that the data full fills the assumptions.

Table-VIII Levene's Test of Equality of Error Variances

Dependent Variable: Post Test			
F	dfl	df2	Sig
2.924	2	87	.059
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Pre Test + Groups			

Table-VIII indicates that the error variance of the dependent variable is equal across sample (p >.05)

Table-IX

ANCOVA Table Tests of Between-Subjects Effects						
Dependent Variable: Post Test						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	385.207a	3	128.402	331.676	.000	.920
Intercept	36.035	1	36.035	93.082	.000	.520
Pre Test	185.940	1	185.940	480.302	.000	.848
Groups	183.580	2	91.790	237.103	.000	.846
Error	33.293	86	.387			
Total	33481.000	90				
Corrected Total	418.500	89				
a. R Squared = .920 (Adjusted R Squared = .918)						
b. Computed using alpha = .05						

Table IX indicates significant effect (p<.0l, f=237.103) for groups (experimental treatment). Experimental treatments (mental training group and Ideo-motor training group) proved to be effective in beginning change in learning "Tai O toshi".

Eta squared is the ratio of variance due to treatment and the total variance. In case of treatment means that 84.6 % of the total variance can be explained by treatment effect and remaining 15.4 % is unexplained.

Table-X LSD Post Hoc Test for Pairwise Comparisons Between Groups

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Mental Training	Ideo Motor Training	-.23333	.40987	.571	-1.0480	.5813
	Control Group	3.03333*	.40987	.000	2.2187	3.8480
Ideo-Motor Training	Mental Training	.23333	.40987	.571	-.5813	1.0480
	Control Group	3.26667*	.40987	.000	2.4520	4.0813
Control Group	Mental Training	-3.03333”	.40987	.000	-3.8480	-2.2187
	Ideo-Motor Training	-3.26667*	.40987	.000	-4.0813	-2.4520
Based on estimated marginal means						
a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).						
*. The mean difference is significant at the 0.05 level.						

Table-X revealed that that significant difference exists between Mental Training group & Control Group; Ideo-Motor Training Group & Control Group. On the other hand, no significant difference was found between Mental Training group & Ideo-Motor Training Group.

Both the experimental treatments (Mental Training group & Ideo-Motor Training Group) proved to be equally effecting in learning “Tai O toshi”.

5. Conclusion

Both the experimental treatments (Mental Training Group & Ideo Motor Training Group) proved to be equally effective in learning Tai o toshi.

6. Discussion of Findings

Naik, S. (2012) conducted a study on the topic “Effect of psychophysical training on the mental

toughness of Judokas and Wrestlers. Result was found that both groups improved in their physical and mental abilities through 3 months imagery & plyometric combined with physical training improve in motivation & confidence of Judokas and Wrestlers. In the present study also, significant effect of Mental Training Group & Ideo Motor Training Group was found on learning Tai o to shi in Judo. The important part of the finding is that 84.6 % if the total variance can be explained by treatment effect and remaining 15.4 % is unexplained.

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Impact of Selected Pranayama Practice on Aggression of College Going Female Students

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Abstract

The purpose of the study was to determine the Impact of selected pranayama Practice(AnulomaVilom pranayama, Bhastrika pranayama) on Aggression of College Going female Studentsof subjects with the age range 19 to 22 years. For this 30 college going female subjects were drawn from Ramanandacollege, Bishnupur, Dist: Bankura (W.B) in January 2017, by using Simple Random Sampling. Pre post data were collected before and after intervention of selected Pranayama for 45 days by using Questionnaire for aggression developed by Anand Kumar and PremShanker Shukla. As calculated value of t (=9.19) is greater than tabulated t0.05 (29) (=2.045). It is concluded Pranayama decrease the aggression level of college going female.

Key Words: The purpose of the study was to determine

Introduction

Yoga, an ancient culture of Indian heritage, regular practice leads to ideal physical, mental, intellectual, and spiritual health. These have a number of beneficial psychological effects in our body. The present work was taken up as data reported on Impact of selected pranayama Practice on Aggression of College Going female Students. The Aim of the study to know whether there is any change in aggression in the subjects practicing pranayama and with that of subjects not practicing any type of pranayama.

Objectives:

The purpose of the study was to investigate the impact of selected pranayama practices on aggression.

Hypotheses:

On the basis of evidence indicating positive effect of pranayama on physical and psychological well-being of an individual the following hypotheses are formulated.
H1 yogic practices contributes to lowering of aggression.

Methodology

Sampling

This study was conducted in 30 samples from Ramanandacollege, Bishnupur, Dist: Bankura (W.B).Samples were selected by applying the simple random sampling using lottery method. 30 were females of age range 19-22yrs.

Research Design:

pre-post single group
Symbolically, A Q1 X Q2
Where;
A= single group
Q1 = pre- test
X= AnulomaVilom pranayama, Bhastrika pranayama(60 min. per day)
Q2= Post-test

Experimental Protocol

A period of 45 days in the month of January to February 2017, the climate condition was cold and atmospheric temperature was varying from 10 o to 18o C. Experimental population of 30 subjects were assembled in field at Ramananda college, Bishnupur, Dist: Bankura (W.B), India. Experimental training was executed from 7:00 AM onwards for 60 minutes, for six days a week and Sunday has been observed as weekly off. Each subjects of the experimental group was ready to learn pranayama. The selected pranayama practice were AnulomaVilom pranayama, Bhastrika pranayama.

Yogic Practices

The Experimental groups participated in the following scheduled of training. It comprised 60 minutes of training followed by discussion and informative lectures.
Initial warm up activity with relaxed breathing techniques and stretching.

Tools Used

Questionnaire for aggression developed by Anand Kumar and PremShanker Shukla.

TABLE -1 Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 pre post	11.93	30	2.30	0.42
	7.53	30	1.30	0.23

TABLE -2 Paired T-Test Table

Mean		Paired Differences					t	df	Sig. (2-tailed)
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	Pre aggression post aggression	4.40	2.62	0.47	3.42	5.37	9.19	29	0.00

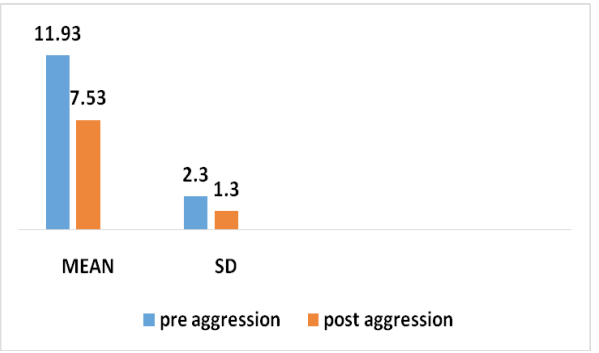

Fig. No. 1

Interpretation of Findings

The following interpretation can be made on the basis of the results shown in the above output.

The values of the mean, standard deviation and standard error of the mean for the data on aggression in the pre and post testing are shown in the Table-1. These values can be used for further analysis.

It can be seen from Table-2 that the value of t statistic is 9.19. This t value is signif1cant as the p value is 0.00 which is less than 0.05. For one - tail test, the value of tabulated t at 0.05 level of significance and 29 (N -1 = 29) df which is 2.045. Since calculated value of t (=9.19) is greater than tabulated t0.05 (29) (=2.045), Hypothesis may be accepted and it may be concluded that Practice of selected Pranayama causes significant decrease in aggression of the all subjects.

Discussion

Table 2 was referred back into the result section. It could be seen from the table that there was a significant difference in case of aggression administrating the pranayama training programme. The effectiveness of Pranayama programme may be due to the reason that Pranayama programme decrease the level of aggression of individuals. Therefore, proposed hypothesis has been accepted in case of aggression.

Conclusions

Pranayama decrease the aggression level of college going female.

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Study of Leg Strength and Speed of Physical Education Students

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Abstract

The present study was conducted with objective to compare the leg strength and speed between the students of B.P.Ed. and M.P.Ed. students. Sixteen (16) Students From B.P.Ed. Course and 16 students from M.P.Ed. course were selected as subject from Department of Physical Education, Guru Ghasidas Vishwavidyalaya, Bilaspur. The current study compared the leg strength and speed between the students of B.P.Ed. Students and M.P.Ed. Students The collected data for the study were analysed using Independent t-test. Independent t-test was applied to find out the significance difference between the groups compared the leg strength and speed & the level of significance was set at 0.05. There is significant difference found between B.P.Ed. Students and M.P.Ed. Students in relation to their leg strength and speed. The results conclude that there is significance difference found between B.P.Ed. Students and M.P.Ed. Students in relation to their leg strength and speed.

Key Words: Leg Strength and Speed

Introduction

Playing ability includes accelerating ability sprint, tackling, and power in different sports and endurance to sustain skill full play for ninety minutes. The legs are the primary source of power in many sports. In the great majority of situations they function as part of a closed kinetic chain which means that one leg is always in contact with the ground. Without functional leg strength the athlete cannot have speed, strength, power, or suppleness to perform. Speed is one of the main fitness components, important for success in many sports. Strength is a conditional ability i.e., it depends largely on the energy liberation processes in the muscles. Strength and Strength training, therefore, assume high importance for achieving good performance in all sports. For some athletes such as Track and Field sprinters, sprint swimmers, cyclists and speed skaters, speed is the most important aspect of fitness. In many other sports, including team field sports, good speed is also very important as part of the overall fitness profile. The strength has provided various benefits in the field of sports and games. Strong and well-conditioned muscle act as shock absorbers and decrease the force that goes through the joints when exercising. They also act as an important balancing agent throughout our body. When muscles are stronger they help to reduce the repetition strain that occurs during running or playing football, rugby or basketball, none of the reason that middle and long distance runners get knee and hip problem is because they neglect their strength training and have muscle imbalance between quadriceps, hamstrings, hip flexors and calves. The purpose of the study was to compare the leg strength and speed of B.P.Ed. and M.P.Ed. course students of Department of Physical Education, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.). It was hypothesized that there would have been a significant difference on leg strength and speed of B.P.Ed. and M.P.Ed. students.

Methodology:

Total 32 male students (16 from B.P.Ed and 16 from M.P.Ed.) were selected as subject from Department of Physical Education, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.). The age of the subject were ranged between 22 to 30 years. Standard test were used and their reliability and validity were the tools for the present study. The test was conducted through the test on both groups. They were given the test separately and thus the data were collected. The data were collected on Total 40 male students . Independent t-test was applied to find out the significance difference between the groups and the level of significance was set at 0.05.

Results:

The statistical results of the comparison of B.P.Ed. and M.P.Ed. Students in relation to their leg strength and 50 meter dash under study are presented in Table-1 and Table-2 respectively.

Table-1: Comparison of Standing Broad Jump Between the Students of B.P.Ed. and M.P.Ed.

Variable	Groups	N	Mean	SD	MD	DF	T-value
Standing Broad	B.P.Ed.	16	2.30	0.10	0.18	30	3.01
Jump	M.P.Ed.	16	2.43	0.18			

Significant at .05 levels Tab. 't' . 0.05 (30) = 2.04

Table – 2: Comparison of Speed Between the Students of B.P.Ed. and M.P.Ed.

Vari-able	Groups	N	Mean	SD	MD	D F	T-value
Speed (50m dash)	B.P.Ed.	16	6.65	0.13	0.20	30	4.95
	M.P.Ed.	16	6.48	0.04			

Significant at .05 levels Tab. 't' . 0.05 (30) = 2.04

Fig 1. Graphical Presentation of Mean Difference of Standing Broad Jump Between B.P.Ed. and M.P.Ed. Students

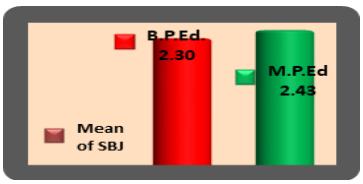
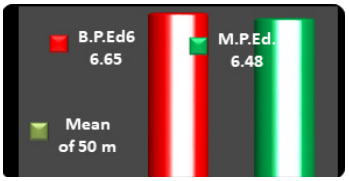


Fig. 2: Mean Difference of 50 m Between B.P.Ed. and M.P.Ed. Students



Discussion of Finding:

It is evident that the obtained t-value is (3.01) which is significant at 0.05 level with df= (30) as it is higher than tabulated t-value (2.04). It may be said that there is difference in relation to standing broad jump between B.P.Ed. and M.P.Ed.. Further t-value is (4.95) which is significant at 0.05 level with df= (30). It indicates the mean score of speed (50m dash) of B.P.Ed. and M.P.Ed differ significantly.

Conclusion:

There is significant difference in standing broad jump and 50 meter dash between students of B.P.Ed. and M.P.Ed. courses. Digiouanna (1943) substantiated the common claim by many coaches that Body structure is associated with athletic success. The study further indicated an association of muscular strength and explosive power and athletics success. Differences between a male athlete group and a normal group in the standing broad jump had critical ratios of 7.07 for basketball players and 8.15 for gymnastics to mention only two.

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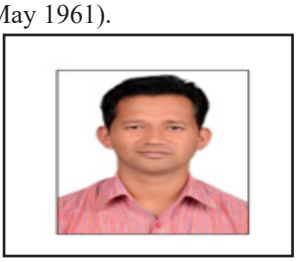

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Estimating Feeder's Performance of Basketball Players on the Basis of Selected Anthropometric Characteristics

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Abstract

The objective of the study was to estimate feeder's performance on the basis of selected anthropometric characteristics. A total of fifty basketball male players were selected who played feeders position of basketball game. All the selected basketball players were from different universities of the country who participated in all India inter university basketball championship. The study was conducted by taking selected anthropometric characteristics (Standing Height, Body weight, Arm length, Fore arm length, Upper arm length, Hand length, Leg length, Thigh length, Lower leg length, Thigh girth and Calf girth) which were independent variable and only one feeders performance was selected for dependent variable. To estimate feeder's performance on the basis of selected anthropometric characteristics, multiple regression analysis was used. Only one regression modal was established and that was: Feeders performance = 9.720 + 0.316 × Standing height.

1. Introduction

Basketball is a highly visible sport with action but never obscured. It uses the largest ball in any team game. In this game there is a continuous thrill of attack and counter attack which appeals to not only the players but also the spectators, who remain warm, dry and comfortable as they support their chosen team. Feederis One of the standard positions in a regulation basketball game. It is also known as point guard. Feeder is normally the smallest player on the team and has perhaps the most specialized role of any position. Essentially, the feeder is expected to run the team's offense by controlling the ball and making sure that it gets to the right players at the right time. A systematic quantitative representation of the human body is done by using the anthropometric techniques. To measure the absolute and relative variability in size and shape of human body these techniques are used. Anthropometric instrumentation may include weighing scale, anthropo meter, skin fold caliper, body volume tanks and bio electrical impendence analyzers all depending on the objective. The Specialization of a concerned sport is its improvement, so it is necessary to provide a very definite and scientific procedure for training technique so that the most efficient and effective performances are obtained.

2. Objective of the Study

2.1. To find out relationship between dependent variable (feeder's performance in basketball) and independent variables (selected anthropometric characteristics).

2.2. To estimate regression equation modal for estimating dependent variables (feeder's performance in basketball) and independent variables (selected anthropometric characteristics).

3. Methodology

A total of fifty basketball male players were selected who played feeders position of basketball game. All the selected basketball players were from different universities of the country who participated in all India inter university basketball championship.

3.2. Variables

The study was conducted by taking selected anthropometric characteristics (Standing Height, Body weight, Arm length, Fore arm length, Upper arm length, Hand length, Leg length, Thigh length, Lower leg length, Thigh girth and Calf girth) which were selected independent variable and only one feeders performance was selected for dependent variable.

To estimate feeder's performance on the basis of selected anthropometric characteristics, multiple regression analysis was used.

Finding and results of the study related to feeders performance.

Testing assumptions to apply multiple regression model.

All the assumptions are based on residuals. Number of residuals are same as number of subjects. It is the difference between two values i.e. one is observed value and another is fitted value of regression line.

- There are four assumptions which should be fulfilled before applying multiple linear regression modal.
- There should be no outliers of residuals.
- Data point should be independent in nature.
- Residuals distribution should be normal having mean= 0 and stand
- The residuals distributions should have constant variance.
- ard deviation=1.

4. Assumptions

Testing assumptions to apply multiple regression model to estimate feeder's performance based on anthropometric characteristics

4.1 Assumptions I: the Checking of Outliers of Residuals

Table 1:Residuals Statistics Related to Feeder's Performance

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	63.4933	74.5644	68.6600	2.53984	50
Residual	-8.49329	11.97618	.00000	3.34765	50
Std. Predicted Value	-2.511	3.541	.000	1.000	50
Std. Residual	-2.034	2.325	.000	.990	50
a. Dependent Variable: Feeder's Performance					

Standardized residuals check the outliers and the value should not exceed ±3. If it exceeds it means that there are outliers. The residuals statistics related to feeder's performance are shown in table 1. Where the minimum value of standardized residual is -2.034. On the other hand the maximum value of standardized residual is 2.325.

4.2 Assumption II: The Checking of Independence of Residuals

Table 2: Durbin-Watson Value Related to Feeders Performance

Durbin-Watson Value	1.033

The estimate or value of Durbin-Watson is used to check the independence of residuals and the value of this estimate test ranges from 0 to 4. The interpretations are, if that the value is near to 0 it shows strong positive correlations and on the other hand, the value near 4, indicates strong negative correlation.

Here table 2 shows the Durbin-Watson value of 1.033. This value is more than 1 and away from 0 and 4. This shows that the assumptions related to independence of residuals is fulfilled i.e. neither strong positive correlations are found nor strong negative correlations are found.

This shows that second assumption of independence of residuals has been fulfilled.

4.3 Assumption III: The Checking of Assumption Related to Constant Variance

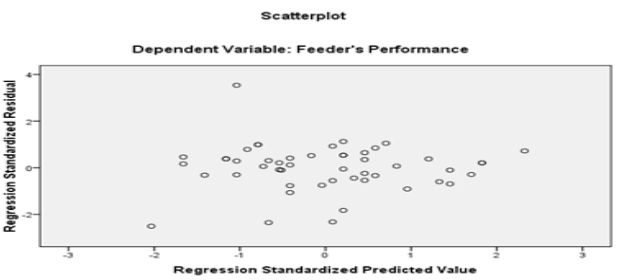

Figure-1: Figure Shows the Scatter Plot of Standardized Residual Versus Standardized Predicted Value

Pertaining to the checking of the assumption of constant variance, there should not be any clear pattern. Figure-1 of scatter plot shows that there is no clear pattern based on this it may be concluded that the variance is constant and third assumption of constant variance is fulfilled.

4.4 Assumption IV: The Checking of Assumption Related to Normality

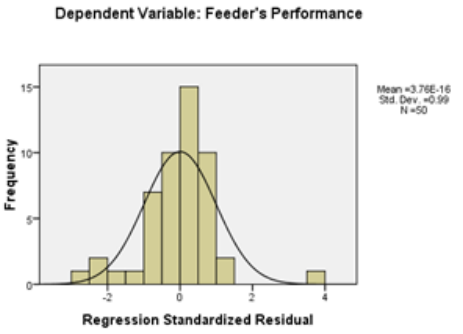

Figure 2: Histogram with Normality Plots Pertaining to Residuals Distribution of Feeder's Performance.

The histogram with normality with residuals distribution in relation to feeder's performance along with mean and standard deviation is shown in figure 2.It Shows that the distribution of residuals fulfill assumptions of the normality.Figure-2 Also shows that the mean of residuals distribution is near to 1 and standard deviation is near to 0.

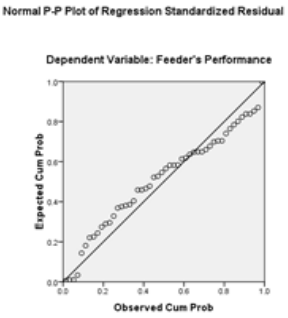

Figure 3: Plot of Normal Probability Pertaining to Residuals Distribution of Feeder's Performance.

Figure 3 shows Q-Q plot to compare the quantiles of a data distribution with the quantiles of standardized theoretical distribution pertaining to residuals distribution of feeder's performance.

The points should be along with the line for normal distribution. All the points are more or less near to standardized line as shown in figure 3.

As all the assumptions are fulfilled, multiple regression analysis was applied to estimate feeder's performance which is based on anthropometrical characteristics.

5. Findings

The analysis of multiple regressions related to estimation of feeders performance on the basis of selected anthropometric characteristics.

Table 3: Model Summary in Relation to Estimation of Feeders Performance Based on Selected Anthropometric Characteristics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1.	.604a	.365	.352	3.38234	1.033
a. Predictors: (Constant), Standing Height					
b. Dependent Variable: feeder's Performance					

Table 3 reveals that only one model is established to estimate feeder's performance on the basis of selected anthropometric characteristics andthat model is on the basis of only one independent variable (standing height). In this table the value of R i.e. .604 is the value of Pearson moment correlation (between feeder's performance and standing height). R square of 0.365 shows that 36.5% of feeder's performance is explained by the Standing Height. Value of adjusted R square is ignored since only one independent variable is included.

Table 4: ANOVA Table Related to Estimation of a Feeder's Performance on the Basis of Selected Anthropometrical Characteristics

Model		Sum of Squares	DF(degree of freedom)	Mean Square	F	Sig.
1	Regression	316.088	1	316.088	27.629	.000a
	Residual	549.132	48	11.440		
	Total	865.220	49			
a. Predictors: (Constant), Standing Height						
b. Dependent Variable: Feeder's Performance						

The analysis of variance (ANOVA) table (table 4) tells about the usefulness of linear regression model for estimating feeder's performance based on selected anthropometric characteristics. F value of 27.629 is significant ($p < 0.05$). This shows that established model is useful and maybeused for estimating feeder's performance on the basis of standing height.

Table 5: Coefficients Related to Estimation of Feeder's Performance on the Basis of Selected Anthropometric characteristics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1	(Constant)	9.720	11.223		.866	.391	-12.846	32.286
	Standing height	.316	.060	.604	5.256	.000	.195	.437
a. Dependent Variable: Feeder's Performance								

The quantification about the relationship between feeder's performance and standing height are stated in table 5. The constant of 9.720 has no practical meaning. When standing height of feeder is 0, this is the value of feeder's performance. This shows that the playing ability of feeder's increases by 0.316with the increase of every one unit of standing height (on an average).

Table 6: Excluded Variables Related to Estimation of Feeder's Performance on the Basis of Selected Anthropometrical Characteristics

1	Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics
	Body weight	-.245a	-1.362	.180	-.195	.402
	Arm length	-.040a	-.252	.802	-.037	.540
	Fore arm length	-.037a	-.249	.805	-.036	.601
	Upper arm length	-.069a	-.481	.633	-.070	.651
	Hand length	-.002a	-.011	.991	-.002	.601
	Leg length	-.008a	-.049	.961	-.007	.457
	Thigh length	.080a	.601	.551	.087	.755
	Lower leg length	-.087a	-.592	.557	-.086	.618
	Thigh girth	-.223a	-1.985	.053	-.278	.990
	Calf girth	.137a	1.177	.245	.169	.966

Model		Beta In	T	Sig.	Partial Correlation Tolerance	Collin-earity Statistics
1	Body weight	-.245a	-1.362	.180	-.195	.402
	Arm length	-.040a	-.252	.802	-.037	.540
	Fore arm length	-.037a	-.249	.805	-.036	.601
	Upper arm length	-.069a	-.481	.633	-.070	.651
	Hand length	-.002a	-.011	.991	-.002	.601
	Leg length	-.008a	-.049	.961	-.007	.457
	Thigh length	.080a	.601	.551	.087	.755
	Lower leg length	-.087a	-.592	.557	-.086	.618
	Thigh girth	-.223a	-1.985	.053	-.278	.990
	Calf girth	.137a	1.177	.245	.169	.966
a. Predictors in the Model: (Constant), Standing Height						
b. Dependent Variable: Feeder's Performance						

Model		Beta In	T	Sig.	Partial Correlation Tolerance	Collin-earity Statistics
1	Body weight	-.245a	-1.362	.180	-.195	.402
	Arm length	-.040a	-.252	.802	-.037	.540
	Fore arm length	-.037a	-.249	.805	-.036	.601
	Upper arm length	-.069a	-.481	.633	-.070	.651
	Hand length	-.002a	-.011	.991	-.002	.601
	Leg length	-.008a	-.049	.961	-.007	.457
	Thigh length	.080a	.601	.551	.087	.755
	Lower leg length	-.087a	-.592	.557	-.086	.618
	Thigh girth	-.223a	-1.985	.053	-.278	.990
	Calf girth	.137[a]	1.177	.245	.169	.966
a. Predictors in the Model: (Constant), Standing Height						
b. Dependent Variable: Feeder's Performance						

The excluded independent variables (bodyweight, arm length, fore arm length, upper arm length, hand length, hand length, leg length, thigh length, calf length) are stated in Table 6, since stepwise method was used,these variables were excluded.

6. Conclusions

In case of estimating feeder's performance only one independent variable (standing height) was found significant out of all selected anthropometric characteristics. 36.5% (Adjusted R-Square= .305) feeder's performance is explained by standing height.

For estimating feeder's performance in basketball on the basis of selected anthropometric characteristics one regression model have been established and established model is: Feeder's performance = 9.720 + 0.316×standing height.

By using this established model one can estimate the feeder's performance by putting the score of standing height in this.

7. Discussion of Findings

Douda, H. T., Toubekis, A. G., Avloniti, A. A. &Tokmakidis, S. P. (2008) concluded in their study that selected anthropometric characteristics are important determinants of successful performance. These findings were practical implications for both training and talent identification since anthropometric characteristics are important determinants of successful performance. Significant difference exist among individual, combative and team game players in relation to selected anthropometric characteristics in that study which was due to the reason that specific type of game, requires specific type of anthropometric measurement. Tan Frankie, H. Y., Polglaze, T., Dawson, B. & Cox, G. (2009) concluded in their study that anthropometric and fitness characteristics can discriminate between players of different competition levels and playing positions. Since there is close association of anthropometric characteristics with the sports performance as revealed by previous research studies also, the regression equation established in this study may be generalized to estimate basketball performance on the basis of selected anthropometric characteristics.

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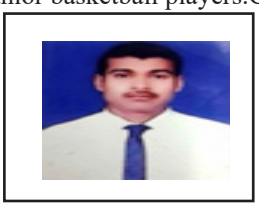

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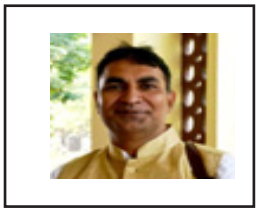

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