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IMPACT OF GYMNASTIC TRAINING ON FLEXIBILITY AMONG SCHOOL GIRLS

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Abstract: *The term 'Gymnastics' derived from Greek word meaning 'to exercise naked'. Gymnastics develop various component of physical fitness such as strength, flexibility, agility, co-ordination, balance and grace. Flexibility is a part and parcel of physical fitness. Actually Gymnastics make a man complete- physically as well as mentally. One hundred (N=100) school girls of Howrah District, West Bengal State were selected at randomly as subjects for the present study. The age limit of the subjects was 10-12 years. All the subjects were divided in to two equal groups such as Gr. G and Gr. C. Gr. G was experimental group who were practiced gymnastics activities and Gr. C was control group. Initially Flexibility measures in various joints in the body were employed to all the subjects of both the groups and thereafter specific gymnastic training were given to Gr. G for three days in a week and continued one year and finally the subjects were retested on criterion measures. The data were analyzed by t-ratio to find out the effects of the treatment. The result of the study showed that the all flexibility measures were improved significantly among gymnastics group after one year gymnastic training.*

Keywords: *Physical Fitness, Flexibility, Gymnastics.*

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INTRODUCTION:

The term 'Gymnastics' derived from Greek word meaning 'to exercise naked'. Gymnastics develop various component of physical fitness such as strength, flexibility, agility, co-ordination, balance and grace. Flexibility is a part and parcel of physical. Flexibility may be defined as a joint's ability to move freely or normal range of motion. Actually gymnastics make a man complete- physically as well as mentally. Gymnastic activities are not only the reflection of body and mind but also a contribution of oneself and the eternal power. Anjel et.al. (2017); Dusan et.al. (2022); studied on related variables and stated that different flexibilities of body parts and it's were improved significantly due to one year gymnastic activities among school going children and players.

Having adequate flexibility can enhance athletic performance, reduce the risk of musculo-skeletal injuries, and improve overall quality of life. Although flexibility varies widely from person to person, minimum ranges are necessary for maintaining joint and total body health. Many variables affect the loss of normal joint flexibility, including genetics, age, activity levels, and previous injuries. The range of motion will be influenced by the mobility of the soft tissues that surround the joint, including muscles, ligaments, tendons, joint capsules, and skin. A lack of stretching, especially when combined with activity, can lead to fatigue-induced soft tissue shortening over time. Mental factor-like confidence, Type (fast twitch and slow twitch) and state of muscle fibres in and around the joints can determine the internal resistance. Example short bones in the feet, wrist and palms make the respective parts more flexible than any other part of the body, Flexibility is directly limited and prevented respectively due to ligaments and tendons.

Flexibility is concerned with the movement that occurs at joints. It indicates the range of movement that is possible at joints. The term is used in the context of freedom of 'movement', or in others senses, various uses of the term 'flexibility' are considered at the end of the section.

DE-LIMITATIONS:

1. The study was delimited to 100 school girls of Howrah District.
2. The study was delimited to 50 Experimental Group and 50 Control Group school girls of 10-12 years from Howrah District.
3. The study was delimited to the Gymnastics Training only as a treatment.
4. The study was further delimited to the range of movement (flexibility) of the following areas:

   Wrist (Dorsi & Planter), Elbow, Knee, Ankle (Dorsi & Planter), Spine and Trunk.

LIMITATIONS:

1. All the flexibility tests were field tests, conducted without a sophisticated instrument like electro-gonio meter. This, it is felt may affect the accuracy of the measurement and thus it is considered as a limitation.

2. Any formal training the subjects had in their past which might have affected their flexibility, is also considered as a limitation.

3. No special means were used to get the best results from the subjects while conducting the field test and it is also considered as a limitation.

HYPOTHESES

Based on the scholar's knowledge, expert's opinions and available research findings, the following hypotheses were formulated.

1. It was hypothesized that there would not be significant differences in the range of motion at the Wrist (Dorsi & Planter), Elbow, Knee, Ankle (Dorsi & Planter), Spine and Trunk flexibility among Experimental Group and Control Group of schoolgirls.

SIGNIFICANCE OF THE STUDY:

1. This study may help to understand the developmental pattern of flexibility among Experimental Group and Control Group of schoolgirls belonging to Howrah District.

2. This study may reveal the gymnastic training improve the flexibility between the Experimental Group and Control Group of schoolgirls.

3. This study may help the coaches and physical education teachers to formulate the flexibility development training to their sports.

METHODOLOGY:

Hundred (N=100) school girls of District Howrah, West Bengal State were selected at randomly as subjects for the present study. The age limit of the subjects was 10-12 years. All the subjects were divided into two equal groups such as Gr. G and Gr. C. Gr. G was experimental group and Gr. C served as control group.

Initially all the flexibility measures of different parts of the body were employed to all the subjects of both groups and thereafter specific gymnastic activities were given to Gr. G for one year and finally the subjects were retested on criterion measures. The data were analyzed by t-ratio to find out the effects of the treatment.

Treatment consists of following gymnastic activities:

Rolling- forward and backward, cart wheel, front turn and back turn, split sitting, handstand, handspring, round-off, back flip, front and back salt.

Prior to gymnastic activities all the subjects of Gr. G performed warm up exercise for 15 minutes. Gymnastics activities were assigned according to degree of difficulty in four phases. Duration and repetition and degree of difficulty were increased gradually at four phases during the treatment season. The concept of the treatment programme was framed on the basis of Rhythmic and Educational Gymnastics.

Http://www.mnps.org/page:11294.aspx

RESULT AND DISCUSSION:

All the flexibility measures were analyzed by paired t-test and level of significance was set up at .05 level of confidence.

TABLE-1

Group means increase in flexibility measures among Gr. G and Gr. C after one year

Variables	Test	Gr. Y (N=50)			Gr. C (N=50)		
		Mean	SD	t	Mean	SD	t
Wrist flexion (Degree)	Pre-test	89.4	5.82	18.93	89.66	6.34	0.10
	Post-test	93.82	5.63		89.24	6.10	
Wrist extension (Degree)	Pre-test	53.94	7.71	15.5	52.16	7.17	0.03
	Post-test	61.16	6.74		51.6	6.59	
Elbow flexion (Degree)	Pre-test	145.60	4.25	21.34	145.34	4.39	0.84
	Post-test	150.36	4.42		144.38	4.58	
Knee flexion (Degree)	Pre-test	138.06	5.88	29.4	137.52	6.43	-0.24
	Post-test	147.72	4.34		136.78	7.01	
Ankle dorsi flexion (Degree)	Pre-test	25.14	3.02	23.95	25.50	3.14	0.92
	Post-test	29.68	3.20		24.58	2.99	
Ankle Planter flexion (Degree)	Pre-test	41.08	6.86	33.0	41.24	6.61	0.12
	Post-test	50.20	6.68		39.82	6.03	

Spine flexion (Inch)	Pre-test	13.25	1.95	29.45	13.24	1.93	-0.21
	Post-test	8.39	1.13		14.16	2.04	
Trunk flexion (Inch)	Pre-test	1.92	2.08	34.4	1.62	1.29	1.12
	Post-test	12.16	3.03		0.92	1.10	

Source : Author`s own calculation

Significant at .05 level of confidence

Table-1 represents the mean values of pre test and post test for wrist flexion, wrist extension, elbow flexion, knee flexion, ankle dorsi flexion, ankle planter flexion, spine flexion and trunk flexion of Gr. G and Gr. C. The t-values of Gr. G for all flexibility measures were 18.93, 15.5, 21.34, 29.4, 23.95, 33.0, 29.45 and 34.4 respectively. To be significant at .05 level of confidence the t-value should be greater than 2.01. In this case, so all the t-values of Gr. G were significant at .05 level of confidence for improving all flexibility measures. The t-values of Gr. C for all flexibilities measures were 0.10, 0.03, 0.84, -0.24, 0.92, 0.12, -0.21 and 1.12 respectively. The t values of Gr. C in relation to improvement of all flexibility measures were not significant at .05 level of confidence.

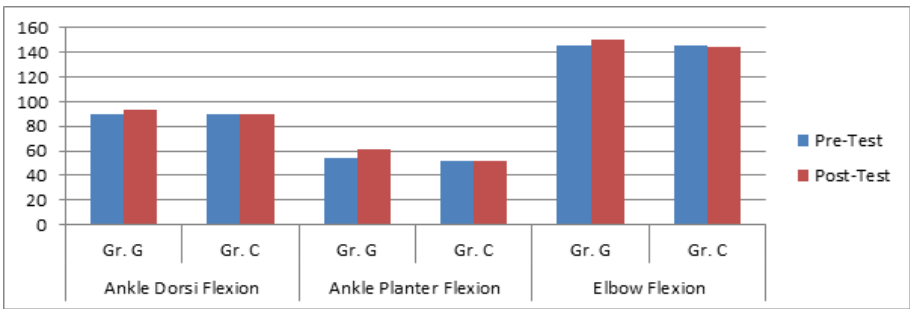

Fig. 1: A comparison of means of pre and post test data on wrist flexion, wrist extension and elbow flexion among Gr. G and Gr. C.

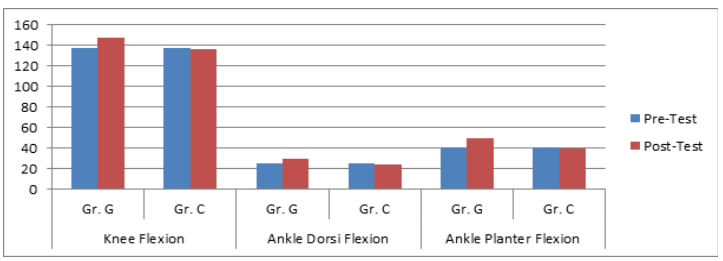

Fig. 2: A comparison of means of pre and post test data on knee flexion, ankle dorsi flexion and ankle planter flexion among Gr. G and Gr. C.

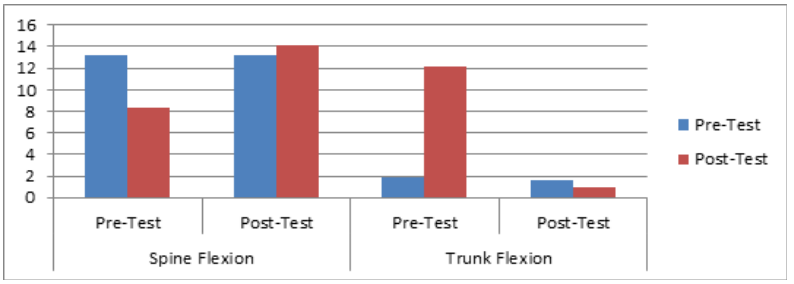

Fig. 3: A comparison of means of pre and post test data on spine flexion and trunk flexion among Gr. G and Gr. C.

Flexibility has been considered not only a component of physical fitness but has been considered as a quality of every individual for a better movement, motor coordination and creative-esthetic performance. In this study eight flexibility measures were tested. The result of the present studies showed that gymnastics improved all flexibility measures such as wrist flexion, wrist extension, elbow flexion, knee flexion, ankle dorsi flexion, ankle planter flexion, spine flexion and trunk flexion significantly at .05 level of confidence after one year treatment. These improvements have been presented bar graph (Fig.-1-3).

Improving joint flexibility is a key component of gymnastics training. The various movements and positions in gymnastics require a high degree of flexibility to perform effectively and safely. Regular gymnastics training helps to stretch and strengthen the muscles around the joints, leading to increased flexibility over time. This can enhance overall athletic performance and reduce the risk of injury. Additionally, gymnastics often incorporates specific stretching exercises targeting different muscle groups and joints to further enhance flexibility. Overall, gymnastics is an excellent activity for improving joint flexibility through dynamic movements and targeted stretching routines. As a subjects of the present study (10-12 years girls) improved their joint flexibility significantly.

In this study gymnastics were used as the way of treatment which involved static stretching, ballistic stretching and dynamic stretching. The result of the present study corroborates with the finding of Anjel et.al. (2017); Dusan et.al. (2022); Locken and Willoughby (1967), Jenson and Fisher (1979), Cureton(1941), Downic(1970), Baley (1977), Ghildial (1980), Bondapadhyay(2012) and partly with the study of Kim & Park (2006) and Boraezynski & Urinaz (2009).

Gymnastics activities not only develop the physical fitness, but also make a sense of fair play and develop individual esthetic values and mental alertness. It also helps to develop mental state.

CONCLUSION

Under the conditions of the present study the results seem to conclude the following:

1. All flexibility measures such as wrist flexion, wrist extension, elbow flexion, knee flexion, ankle dorsi flexion, ankle planter flexion, spine flexion and trunk flexion were improved significantly due to one year treatment of gymnastic activities among Experimental Group.

2. All flexibility measures such as wrist flexion, wrist extension, elbow flexion, knee flexion, ankle dorsi flexion, ankle planter flexion, spine flexion and trunk flexion were not improved significantly due to one year treatment of gymnastic activities among Control Group.

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