

**Abstract:-**

It is indeed unfortunate that in our modern era of technologic and scientific achievement, in which man has walked on the moon, developed surgical procedures to prolong and enhance the quality of life, and discovered many of the secrets of molecular interaction, there is no adequate explanation for a seemingly simple question: why do people become too prone to hypokinetic diseases and what can be done to prevent it? Regular physical activity would be important for life's quality even if it had no relationship to disease and longevity. Physical activity is a significant ingredient in the quality of life, because it increases energy and promotes, physical and mental well being in addition to conferring health benefits. 12,600 Boys from various schools of various districts India [Tripura (TR), Meghalaya (ML), Assam (AS), Mizoram (MZ), Manipur (MN), Nagaland (NL) and Arunachal Pradesh (A.R.)] (N=12,600) were selected as subjects at random. Their age ranged from 13 to 15 years (studying from 7th to 10th standard). Flexibility was measured by the sit and reach box test. Mean and standard deviation were computed by using SPSS statistical package. The calculated mean (\bar{X}) and standard deviation (σ) was used to find out the Hull Scale. The result of the study shows that the adolescent boys of North-Eastern states were differing on flexibility. Hence it was concluded that, age, geographical region, growth, social behaviour, food habit and level of physical activity in curriculum and social life may influence the flexibility of adolescent boys of North-Eastern states.

CONSTRUCTION OF NORMS: HIP FLEXIBILITY OF NORTH-EASTERN STATES ADOLESCENT BOYS.



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INTRODUCTION

Flexibility can be most simple defined as the range of possible movement in a joint (hip joint) or series of joints. The need for flexibility varies with the athletic endeavour, but in some activities it is all-important. It should be recognized from the outset that flexibility is specific to a given joint or combination of joints. As with speed of movement, an individual is a composite of many joints, some of which may be unusually flexible, some inflexible and some average. Accordingly, it would be incorrect to speak of a flexible individual. In agreement with much human experience, the laboratory studies also showed that within the range of normal human deep-muscle temperatures, the amount of structural weakening produced by a given amount of tissue elongation varies inversely with the temperature. The North-Eastern states have different temperature and geographical nature. The level of physical activity also varies from place to place. Hence the research intended to assess and construct norms on flexibility of North-Eastern state adolescent boys.

METHODOLOGY

To achieve this purpose (N=12,600) adolescent boys from schools of various districts of North-Eastern states of India [Tripura (TR), Meghalaya (ML), Assam (AS), Mizoram (MZ), Manipur (MN), Nagaland (NL) and Arunachal Pradesh (A.R.)] (N=12,600) were selected as subjects at random. Their age ranged from 13 to 15 years (studying from 7th to 10th standard). Flexibility was measured by the sit and reach box test (E-source-1) to construct the norms of flexibility test; mean and standard deviation were computed by using SPSS statistical package. After calculating the mean (X) and standard deviation (σ) the scores were converted into Hull Scale (Verma 2009).

Table - 1
Norms for different states of north-eastern states adolescent boys of 13, 14 and 15 years on Flexibility

Age		TR	ML	AS	MZ	MN	NL	A.R.
13 Yrs	\bar{X}	7.83	4.89	6.76	8.31	8.69	7.47	8.93
	σ	4.25	2.31	3.68	3.55	4.29	3.41	4.02
14 Yrs	\bar{X}	7.52	6.31	6.99	8.07	14.31	9.03	8.26
	σ	4.19	3.16	2.97	3.38	7.44	4.17	3.88
15 Yrs	\bar{X}	7.22	7.63	7.22	9.65	15.65	10.83	10.69
	σ	3.51	3.67	3.50	3.67	6.93	4.93	4.16

Table - 2
Percentage of qualitative grading for the constructed norms for difference states of north-eastern state boys of 13, 14 and 15 years on flexibility

Age	Scores	Qualitative Grading (%)	TR	ML	AS	MZ	MN	NL	A.R.
13 Yrs	0 - 20	Very poor	-	-	-	-	-	-	-
	21 - 40	Poor	35.84	46.67	49.17	34.17	28.00	42.50	34.50
	41 - 60	Average	46.33	41.50	35.17	50.33	53.17	46.17	45.33
	61 - 80	Good	16.00	8.33	13.50	13.17	18.17	8.00	19.17
	81 - 100	Excellent	1.83	3.50	2.16	2.33	0.66	3.33	1.00

14 Yrs	0 - 20	Very poor	-	-	-	-	-	-	-
	21 - 40	Poor	39.67	44.50	43.33	36.17	27.33	35.84	38.17
	41 - 60	Average	46.67	36.83	46.33	53.50	52.17	46.83	43.67
	61 - 80	Good	11.16	18.00	9.67	8.33	20.50	14.50	17.50
	81 - 100	Excellent	2.50	0.67	0.67	2.00	-	2.83	0.66
15 Yrs	0 - 20	Very poor	-	-	-	2.50	7.33	-	1.33
	21 - 40	Poor	43.67	38.17	42.50	25.67	13.00	23.33	23.00
	41 - 60	Average	37.17	46.00	41.00	57.67	63.83	63.67	59.67
	61 - 80	Good	17.16	14.83	14.17	12.00	15.84	13.00	14.33
	81 - 100	Excellent	2.00	1.00	2.33	2.16	-	-	1.67

TR: Tripura, **ML:** Meghalaya, **AS:** Assam, **MZ:** Mizoram, **MN:** Manipur, **NL:** Nagaland and **A.R.:** Arunachal Pradesh.

13 yrs: it was concluded that irrespective of North-Eastern states of India minimum of 28% to maximum of 49.17% boys were in the category of very poor and poor on flexibility.
14 yrs: it was concluded that irrespective of North-Eastern states of India minimum of 27.33% to maximum of 44.50% boys were in the category of very poor and poor on flexibility.
15 yrs: it was concluded that irrespective of North-Eastern states of India minimum of 20.33% to maximum of 43.67% boys were in the category of very poor and poor on flexibility.

DISCUSSION

Quality of life is enhanced by improving and maintaining a good range of motion in the joints. Overall flexibility should be developed with specific joint range of motion needs in mind as the individual joints vary from one to another. Loss of flexibility can be a predisposing factor for physical issues such as pain syndromes or balance disorders.

Gender, age, and genetics are important for range of motion. Exercise including stretching often improves flexibility. Many factors are taken into account when establishing personal flexibility: joint structure, ligaments, tendons, muscles, skin, tissue injury, fat (or adipose) tissue, body temperature, activity level, age and gender all influence an individual's range of motion about a joint. Individual body flexibility level is measured and calculated by performing a sit and reach test, where the result is defined as personal flexibility score.

Static-active stretching includes holding an extended position with just the strength of the muscles such as holding the leg in front, side or behind. Static-active flexibility requires a great deal of strength, making it the hardest to develop. Ballistic stretching is separate from all other kind of stretching. It does not include stretching or any kind of bouncing motion. The actual performance of ballistic movements prevents lengthening of tissues. These movements should only be performed when the body is very warm; otherwise they can lead to injury (E-source-2).

Ligaments are composed of two different tissues: white and yellow. The white fibrous tissues are not stretchy, but are extremely strong so that even if the bone were fractured the tissue would remain in place. The white tissue allows subjective freedom of movement. The yellow elastic tissue can be stretched considerably while returning to its original length (E-source-3).

Stretch receptors have two parts: spindle cells and golgi tendons. Spindle cells, located in the centre of a muscle, send messages for the muscle to contract (E-source-4). On the other hand, golgi tendon receptors are located near the end of a muscle fibre and send messages for the muscle to relax. As these receptors are trained through continual use, stretching becomes easier. When reflexes that inhibit flexibility are released the splits then become easier to perform. The splits use the body's complete range of motion and provide a complete stretch.

Internal Factors of flexibility refers movement demands include strength, endurance and range of motion. Training oversights occurs when the body is overused (E-source-5). Internally, the joints, muscles, tendons, and ligaments can affect one's flexibility. The mental attitude of the performer during the state of motion can also affect their range.

The majority of "flexibility" work should involve performing exercises designed to reduce the internal resistance offered by soft connective tissues. Most stretching exercises attempt to accomplish this goal and can be performed by almost anyone, regardless of age or gender (E-source-6). Upper body

flexibility continues to decline during the 50th decade of life and has implications for influence on aspects of health-related quality of life in this segment of the population (Fabre 2007). Studies strongly suggest that growth is not a cause of decreased flexibility during the prepubescent period (Feldman 1999).

Explored developmental patterns of gender traditionalist and flexibility in middle childhood and early and late adolescence and assessed the correlates of gender flexibility at these 3 developmental periods. Most variables assessed contributed significantly and cumulatively to the prediction of gender flexibility; socialization variables proved to be the strongest predictors of all 3 developmental levels (Katz 1994).

Children are also more flexible than adults. During the rapid growth of puberty, kids often become temporarily less flexible than they were prior to puberty. Some children have a slow growth spurt; while others grow so fast they need a speeding ticket. Essentially, their bones are growing more quickly than their muscles and tendons can stretch to keep up. Most boys get more muscles and lose some body fat, but often lose flexibility.

Having good flexibility may help some athletes self-select into certain sports such as swimming, diving, gymnastics, tennis, figure skating, wrestling, or martial arts. Understanding these changes in body composition and flexibility can prepare adolescent for their potential effect or compete while going through puberty (Paul 2013). The sit-and-reach score does not distinguish spine and pelvic flexibility differences in men and women and does not adequately assess hip flexibility (Mier 2013).

CONCLUSION

From the result it is clear that when age advances in adolescent years flexibility is improved. The boys of A.R., MN and NL state show better flexibility. Irrespective of state a minimum of 49.17% (13 yrs), 44.50% (14 yrs) and 43.67% (15 yrs) adolescent boys were in the category of very poor and poor in flexibility.

IMPLICATION:

Curriculum and health awareness will be reformed for the adolescent boys of North-Eastern states. The role of flexibility may be inculcated to parents, pupils and teachers. The state government and M.H.R.D. may give importance for health of the adolescents.

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