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# The Study Was to Compare the Physical Flexibility of Urban and Rural Children

**Prasanna Kumara B. S.[1]* Dr. R. Munireddy[2]**

[1] Physical Education Director, GFGC, Bangalore-560074

[2] Directorate of Physical Education, Bangalore University, Bengaluru, Karnataka

***Abstract – Flexibility is very important performing the movement with high degree of skills, the technical skill to a lesser or greater extent is affected by the flexibility of the concerned joints. Insufficient flexibility leads to errors in movement flow, movement shyness; movement coupling extra, learning of movements (motor learning) becomes difficult in a sportsman who lacks flexibility.***

***Keywords: 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.***

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## INTRODUCTION

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 1000 schoolboys of Karnataka state.
2. The study was delimited to 500 Urban and 500 Rural schoolboys of 10-14 years from Karnataka State.
3. The study was delimited to 100 boys in each age group.
4. The study was further delimited to the range of movement (flexibility) of the following areas.

- Shoulder
- Shoulder and Wrist
- Trunk and Neck
- Trunk and Hamstring muscle
- Hip
- Ankle
- Dynamic (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 trunk, hip, shoulder, trunk and neck, ankle and dynamic flexibility among Rural and Urban schoolboys of different age groups.
2. It was hypothesized that there would not be significant differences in physical growth, among 10-14 years Rural schoolboys.

3. It was hypothesized that there would not be a significant difference in physical growth among 10-14 years Urban.

4. It was hypothesized that there would not be significant differences in the range of motion at the trunk, hip, shoulder, trunk and neck, ankle and dynamic flexibility among 10-14 years Rural and Urban schoolboys.

## SIGNIFICANCE OF THE STUDY

1. This study may help to understand the developmental pattern of flexibility among Rural and Urban boys of 10 to 14 years belonging to Karnataka state.

2. This study may reveal the differences in physical growth factors and flexibility between the Rural and Urban boys.

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

## METHODOLOGY

For the selections of the subject, random sampling technique was adopted. A total of 1000 subjects, 100 subjects in each age group of 10-14 years among the Urban and Rural school-going boys were selected for this study. The age of the subjects was ascertained from the school records and accordingly the age groups were classified.

## ANALYSIS OF DATA AND RESULT

The findings about physical growth and development of flexibility variables such as height, weight, shoulder flexibility, shoulder and wrist flexibility, Trunk and neck flexibility, Trunk and hamstring flexibility, ankle flexibility and dynamic flexibility of Rural and Urban boys of 10-14 years age group are as shown in the tables given below.

**TABLE – 1**

**ANALYSIS FOR VARIANCE FOR SHOULDER ROTATION FLEXIBILITY BETWEEN RURAL AND URBAN BOYS OF 10-14 YEARS OF AGE**

| Source | Sum of Squares | Degree of Freedom | Mean Squares | 'F'Ratio | Table value |
|---|---|---|---|---|---|
| Rows (age) | 466.01 | 4 | 116.50 | **11.20*** | 2.42 |
| Column (group) | 1265.62 | 1 | 1265.62 | **121.69*** | 3.86 |
| Interaction (age and group) | 2319.25 | 4 | 579.81 | **55.75*** | 2.38 |
| Error | 9940.49 | 990 | 10.04 | -- | |
| Total | 13971.37 | 999 | -- | -- | |

*p<.05
$F_{.05}(4,198)=2.42$
$F_{.05}(1,490)=3.86$
$F_{.05}(4,990)=2.38$

Table-1 demonstrates that there were significant differences in rows (age), column (group) and Interaction (age and groups). The obtained 'F' ratios 11.20, 121.69 and 55.75 for shoulder rotation flexibility are greater than corresponding table values (2.42), (3.86 and 2.38) respectively.

Since interaction was statistically a highly significant factor, simple effects test was carried out for **shoulder rotation flexibility** of Rural and Urban boys in the age group of 10-14 years, instead of separate posthoc test for rows and columns.

The average of shoulder rotation flexibility between Rural and Urban boys of 10-14 years age groups and their interaction are illustrated figure-1.

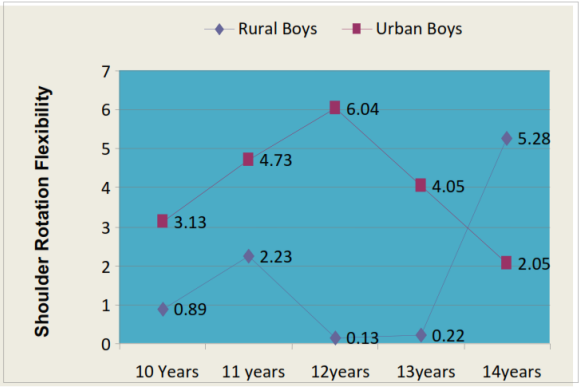


**Figure-1: Interaction effect of Shoulder Rotation Flexibility among 10 – 14 years Rural and Urban boys of Karnataka**

**TABLE – 2**

**SIMPLE EFFECTS TEST FOR SHOULDER ROTATION FLEXIBILITY AMONG RURAL AND URBAN**

**BOYS OF 10-14 YEARS OF AGE GROUP**

| Source of Variance | Sum of Squares | Degree of Freedom | Mean Squares | 'F' Ratio | Table value |
|---|---|---|---|---|---|
| Rural | 1839.62 | 4 | 459.90 | **45.80*** | 2.39 |
| Urban | 925.64 | 4 | 231.41 | **23.04*** | |
| 10 years | 250.88 | 1 | 250.88 | **24.98*** | 3.89 |
| 11 years | 312.50 | 1 | 312.50 | **31.12*** | |
| 12 years | 1746.40 | 1 | 1746.40 | **173.94*** | |
| 13 years | 733.44 | 1 | 733.44 | **73.05*** | |
| 14 years | 521.64 | 1 | 521.64 | **51.95*** | |
| Error | 9940.49 | 990 | 10.04 | -- | |

*p<.05
$F_{.05}(4,495)=2.39$
$F_{.05}(1,198)=3.89$

The above table-14 reveals that the obtained 'F' ratio 45.80 and 23.04 for shoulder rotation flexibility of Rural and Urban boys respectively were found significant. This shows that the shoulder rotation flexibility differs from one age group to another age group of 10 to 14-year boys. Since the simple effects test was found significant, the Post-hoc test was employed to compare the paired means of Rural and Urban boys and also between 10–14 years boys.

**TABLE – 3**

**SCHEFFE'S POST-HOC ANALYSIS FOR SHOULDER ROTATION FLEXIBILITY AMONG 10-14 YEARS AGE OF RURAL BOYS**

| Areas | Means of Different age groups | | | | | Mean |
|---|---|---|---|---|---|---|
| | 10 years | 11 years | 12 years | 13 years | 14 years | difference |
| Rural | 0.89 | 2.23 | | | | 1.34* |
| | 0.89 | | 0.13 | | | 0.76 |
| | 0.89 | | | 0.22 | | 0.67 |
| | 0.89 | | | | 5.28 | 4.39* |
| | | 2.23 | 0.13 | | | 2.10* |
| | | 2.23 | | 0.22 | | 2.01* |
| | | 2.23 | | | 5.28 | 3.05* |
| | | | 0.13 | 0.22 | | 0.09 |
| | | | 0.13 | | 5.28 | 5.15* |
| | | | | 0.22 | 5.28 | 5.06* |

* significant at 0.05 level.

**Critical interval: 1.32**

The table-3 indicated that there were significant differences for shoulder rotation and flexibility between different age groups of 10-14 years, except the age groups of 10 11, 10 and 13, 12 and 13 years. The mean differences (1.34, 4.39, 2.10, 3. 05, 5.15 and 5.06) are greater than the critical interval value (1.32). It is also noticed that there were no significant between 10 and 12, 10 and 13, 12 ad 13 years of Rural boys, as their mean differences (0.76, 0.67 and 0.09) is less than the critical interval (1.32).

The average mean difference of shoulder rotation flexibility among 10-14 years of Rural boys is graphically presented in figure – 3.

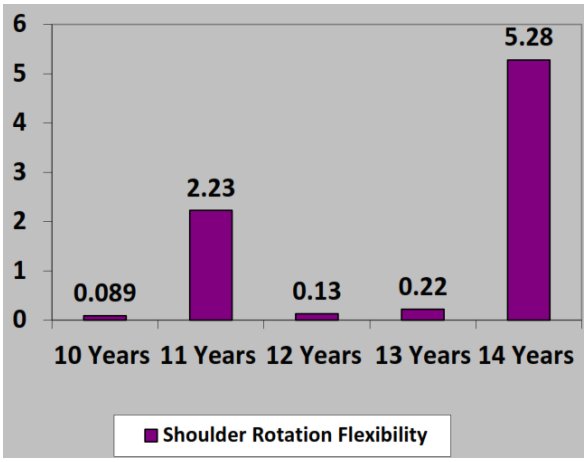


**Figure-3: Average Shoulder Rotation Flexibility of 10 – 14 years Rural School Boys of Karnataka**

## CONCLUSIONS:

Based on the findings of the study, the following conclusions have been drawn.

1. Rural boys superseded their Urban counterparts in all the age groups in shoulder and wrist flexibility.
2. Rural boys were found superior in trunk and hamstring flexibility compared to their Urban counterparts in all the age groups.
3. Rural boys were found superior in hip flexibility in all age groups except 12 years.
4. Rural boys overshadowed their urban boys in ankle flexibility except for 10 years.
5. Rural boys exhibited better dynamic flexibility in 10, 11 and 13 years. However urban boys superseded their rural counterpart in dynamic flexibility in 12 and 14 years.
6. Most of the flexibility test, rural boys were found superior to urban boys.

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**Corresponding Author**

**Prasanna Kumara B. S.***

Physical Education Director, GFGC, Bangalore-560074