SUMMARY, CONCLUSIONS AND IMPLICATIONS

SUMMARY:

Introduction

During the last ten years several studies in physical fitness have been conducted in India covering diverse populations. Only after of these have tried to assess physical fitness of the females in general. It is noteworthy that the female age group of twelve to fifteen years has not been investigated at all in terms of physical fitness.

The purpose of this study, therefore, was to prepare norms for the girls of Punjab belonging to the age group of twelve to fifteen on the Fleishman's Physical Fitness Test Battery, and to study how development in physical fitness takes place in this age group. Further, efforts were made to compare the levels of physical fitness between urban and rural girls of Punjab.

Title

"Assessment of Physical Fitness of High School Girls of Punjab".

Objectives

The study was undertaken to achieve the following objectives:
1. To prepare the norms of physical fitness items as listed in Fleishman's physical fitness test battery on high school girls of Punjab.

2. To determine physical fitness status of high school girls of Punjab.

3. To compare the physical fitness index of the urban high school girls with that of the rural high school girls of Punjab.

4. To compare the physical fitness of high school girls according to age steps of 12, 13, 14 and 15 years on various components of physical fitness.

5. To enable the teachers of physical education to develop physical fitness programmes for those girls who do not possess the required standard of physical fitness.

Hypotheses

The hypotheses formulated for the study were as follow:

1. There would be significant differences between urban and rural high school girls with regard to the following variables:
   i) Extent flexibility,
   ii) Dynamic flexibility,
   iii) Explosive leg strength,
   iv) Arm and shoulder strength,
   v) Explosive leg strength,
vi) Arm, hand and shoulder strength,
vii) Endurance level of arms and shoulder,
viii) Trunk strength,
ix) Coordinative ability,
ix) Gross body equilibrium,
xi) Cardio-vascular endurance,
xii) Speed of running.

2. There would be significant differences in four groups of high school girls belonging to the ages 12, 13, 14 and 15 years in terms of the following study variables:

i) Extent flexibility,
ii) Dynamic flexibility,
iii) Speed of change of direction,
iv) Arm and shoulder strength
v) Explosive leg strength,
vi) Arm, hand and shoulder strength,
vii) Endurance level of arms and shoulder
viii) Trunk strength,
ix) Coordinative ability,
x) Gross body equilibrium,
xi) Cardio-vascular endurance,
xii) Speed of running.

3. There would be significant independent effects of residence, age and residence x age on all the variables.
METHODOLOGY

Design

The study was cross-sectional in design in which four age steps were studied simultaneously and the development of the physical fitness of girls investigated. The design was such that it facilitated the comparison of physical fitness between urban and rural high school girls of Punjab.

Sample

The study sample consisted of 4,000 high school girls in the age group of 12 to 15. These subjects were selected from the various urban and rural schools of Punjab. Three hundred and thirty four subjects were randomly selected from eleven out of the twelve districts of Punjab. Half of this number i.e. 167 each was taken from the urban and the rural schools of every district. Thus, the total number of subjects from eleven districts came to $334 \times 11 = 3674$. The remaining 326 subjects were chosen from the twelfth district of Punjab to bring the sample figure to 4,000. This twelfth district happened to be that of Ropar. Half of the 326 subjects were from the urban schools of Ropar and half from its rural schools were selected at random.

Selection of tests

The investigator used the Fleishman's physical fitness test battery comprised of the following test items:

1. Twist and Touch Test
2. Bend, Twist and Touch Test
3. Shuttle Run Test
4. Soft Ball Throw Test
5. Hand Grip Test
6. Push Ups Test
7. Leg Lifts Test
8. Cable Jump Test
9. Balance - A Test
10. 600 Metre Run Walk Test

Apart from the basic physical test battery, two additional Fleishman's test items used in this study were:
1. Standing Broad Jump Test
2. 50 Metre Dash Test

Collection of Data

The twelve tests were administered one after the other separately. Teachers of physical education of the respective schools helped in the administration of tests. The subjects were given instructions regarding each test which was followed by a demonstration to show them as to how they should take the test. Groups (20 subjects in each group) rotated to undertake three different tests, followed by three more tests until all the tests were finished.

Statistical Design

The data were analysed, firstly, to determine the nature of distribution of scores by calculating the values of skewness and kurtosis for physical fitness variables of
the high school girls of Punjab. Percentile scale was used to compute norms for different age groups. The mean, median and standard deviations were calculated of all the variables. The analysis of variance ($2 \times 4$ ANOVA) was used to test the hypothesis. Wherever $F$ was found significant, a $T$ test was calculated to determine the direction of differences.

**Results**

The computed skewness revealed that the data was skewed positively on some tests while in others it was skewed negatively. In the age group of 12 year olds the data was skewed positively in ten test items while in two tests it was negative. In the case of 13 year old girls, the data was positively skewed in ten tests while in two tests it was negatively so. For the age group of 14 years the data was skewed positively in ten test items and negative in two test items. In the case of 15 year old girls, the data was positively skewed in nine tests while in three tests it was negatively skewed.

The percentile norms indicate that there was significant improvement in performance levels from 12 to 15 years in all the tests except those of flexibility coordinative ability, gross body equilibrium.

The results of $2 \times 4$ ANOVA revealed that there was interaction effect of residence and age on physical fitness variables such as dynamic flexibility, arm and shoulder
strength, explosive leg strength, arm, hand and shoulder strength, endurance level of arms and shoulder, trunk strength, gross body equilibrium and cardio-vascular endurance, while the effects of residence and age were independent against the variable such as extent flexibility, speed of change of direction, coordinative ability and speed of running.

CONCLUSIONS

1. Percentile norms for the physical fitness variables were found suitable to assess the physical fitness level of high school girls of Punjab belonging to the age group of 12 to 15 years.

2. The two groups based on residence (urban, rural) have been found significantly different from each other against physical fitness variables such as dynamic flexibility, arm and shoulder strength, arm, hand and shoulder strength and trunk strength whereas there were no significant differences against the variables of extent flexibility, speed of change of direction, explosive leg strength, endurance level of arms and shoulder, coordinative ability, gross body equilibrium, cardio-vascular endurance and speed of running.

3. The four age steps were found significantly different from each other against most of the physical fitness variables, while there were no significant differences in a few variables between some age steps. This suggested that different age steps independently
effects some of the dependent variables, while these age steps interact with regard to other variables.

4. The results of residence x age interaction revealed significantly independent effect against the variables of dynamic flexibility, arm and shoulder strength, explosive leg strength, arm, hand and shoulder strength, endurance level of arms and shoulder, trunk strength, gross body equilibrium and cardio-vascular endurance. But the results were not found to be significant for the variables of extent flexibility, speed of change of direction, coordinative ability and speed of running, indicating that there is a notable interaction between residence and age in the above mentioned physical fitness variables.

5. The subjects belonging to urban residence were significantly superior to rural subjects in terms of dynamic flexibility, arm and shoulder strength, arm, hand and shoulder strength and trunk strength variables. But the results were not found to be significant between the urban and rural girls against extent flexibility, speed of change of direction, explosive strength, endurance level of arms and shoulders, coordinative ability, cardio-vascular endurance and speed of running.
6. The physical fitness levels of 12, 13, 14 and 15 year old girls differed significantly, the performance of the 15 year old girls in speed of change of direction, arm and shoulder strength, explosive leg strength, arm, hand and shoulder strength, endurance level of arms and shoulders, trunk strength and speed of running variables were significantly higher as compared to 12, 13 and 14 year old girls. The performance of the 14 year old girls were superior to 12 and 13 year old girls in the above mentioned test items as well. The 13 year old girls were found significantly better on extent flexibility, dynamic flexibility, coordinative abilities and gross body equilibrium as compared to 12, 14 and 15 year old girls.

**IMPLICATIONS**

1. The norms developed through this study provide an opportunity to the physical education teachers to the fitness level of the students to indicate their relative fitness status.

2. The study revealed the lower performance level of rural students in most of the physical fitness variables as compared to their urban counterparts. The teachers and coaches working in rural areas must pay special attention to develop physical fitness among the girls of rural areas. One reason for lowered performance of rural girls may be attributed to the
socio-cultural environment of the Punjab State. The adult education programmes should be re-designed to change their outlook towards women's participation in sports.

3. Another implication of the study is that physical fitness programmes should be based on age to suit each age group. The developmental needs of each age step should be kept in view and the programmes structured accordingly.

4. Special programmes should be worked out to promote the fitness variables in which the Punjabi girls are lagging behind.

5. A research cell should be set-up in Punjab to scrutinize the performance of the subjects in physical fitness each year and revise the norms when the performance level improves.

Suggestions for further research

1. A similar study can be conducted on college girls.

2. A possibility be explored to conduct a similar study by taking samples from other states of the country.

3. The present study was limited to the age group of 12 to 15. The physical fitness in the earlier age groups is also important and should be assessed.

4. Physical fitness may be studied by using tests other than the ones which have been used in this study.