Study on Physical Growth and Development and Nutritional Status in Korean

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I. Introduction

The students now enrolled with the primary, middle, high schools and the universities or colleges will eventually assume important responsibilities in the future society of Korea. Also there will be no objection to the argument that promotion of health and improvement of physical conditions among these students must precede on all occasions their intellectual, moral and ethical development. It could be said, without distorting the reality too much, that such important aspects of student's life as health and improvement of physical conditions have so far been buried in an absolute oblivion.

The findings led us to the submission of a proposal to stage an overall health check-up for the students of both sexes of not only the university or colleges but also of the primary, middle and high schools for the purpose of grasping the facts about their physical conditions and nutrition status. Observation of the existing, if any, systems as well as facilities of school health administration comprises another important aspect of this study. Efficient administration of student health has been the topic of those personally concerned about, but unfortunately, it has not constituted so far a sufficient moment to influence

changes in policies or a down-to-earth implementation of existing policies. Plans are under way to make recommendations, upon completion of the study and based on factual data to be obtained, to the authorities concerned, in the hope to form an epochal moment to promote student health and to reactify the existing "physical condition and nutritional status".

The present study has been carried out by the Department of Preventive Medicine, College of Medicine, Kyung Hee University, under the financial sponsorship of the Korean Traders Scholarship Foundation in Korea.

II. Material and Method

1. Sampling Design

   a) Those Surveyed

   The object belonging to sample schools of all level (primary, middle, high schools, colleges and universities) in the two special city and nine province, were as follows;

2. Progress in the Survey

   a) Personnel Mobilized for Field Survey 6

   b) In the field survey arrangements had been made to secure positive cooperations of the teachers in charge of the class as well as of the gymnastics teachers. The measurements of various

Number of Students Surveyed by Age and Sex

Age	Male	Female	Both of sex
6	535	500	1,035
7	524	484	1,008
8	664	547	1,211
9	1,704	1,243	2,947
10	2,179	1,712	3,891
11	2,446	1,747	4,193
12	2,155	1,908	4,063
13	2,286	1,843	4,129
14	2,726	1,767	4,493
15	2,847	1,690	4,537
16	2,944	1,550	4,494
17	2,090	732	2,822
18	1,293	317	1,610
19	520	200	720
20	115	137	252
21	122	148	270
22	110	180	290
23	117	180	297
24	117	171	288
Total	25,494	17,056	42,550

physical development indicators were done at classrooms or auditoriums.

c) Items and Equipments of Physical Measurements

Items	Equipments
Body height	Martin's Anthropometer
Body weight	Yamato's (500gm. limits)
Chest girth	150cm tape measure
Sitting height	Sitting height meter

d) Period of survey

All surveys falling under this category were completed during the period from 1 May to 31 August 1978.

III. Summary of the findings

1. Physical Growth and Development

a) Body Height

Rapid growth of physical growth in terms of body height has been observed among males in the age 7 - 15 and among females 7 - 13. Growth in terms of body height turned out to be slower among students of heigher ages by both sexes. This indicates that girls enter a rapidly growing stage 2 years earlier than boys. The age of cross over between to sexes is between 9 to 12 years where upon female out growth male. Among both the male and female students growth in terms of increaese in body height turned out to be substantially inactive at ages 6 and 7 compared with the other ages. Meanwhile, prominent improvement in body height of national students over period of ten year was noticed.

b) Body Weight

Physical growth in terms of body weight seemed to be most favorable with students in special cities and less favorable towards the local cities or rural area.

Rapid growth, in terms of body weights measured with students of various ages, which is described by a straight line on a growth curve, has been observed among males in the ages 7 - 15 and among females aged 7 - 13, as in the case of body height. Growth body weight was found to be slower among students of higher ages by both sexes. The age of cross over between to sexes is between 9 to 13 years where upon female out growth male. On the average females were found to enter a rapidly growing stage two year earlier than the males. Among both the males and females growth in terms of increase in body weight turned out to be substantially inactive at age 6 and 7 compared with the other ages.

c) Chest Girth

Increase of chest-girth was found to be most intens at ages 7 - 15 by males and females of both sexes. Growth at ages above these was found to be less active. In terms of annual growth rate, boys aged 13 - 14 and girls in the ages 11 - 12 demonstrated to be most active, indicating that girls enter the most rapidly growing stage two year earlier than boys. The age of cross over between to sexes is between 10.5 to 13.5 years where upon female out growth male. Growth of Koreans in terms of chest-girth increase prevailed over that of the Japanese at ages 6 - 11 and 12 or more in the case of the males and at 6 - 12 and 13 or more in the case of females.

d) Sitting Height

Rapidly gorwing stages were observed at ages 11 - 14 by males and at 7 - 12 by females. Highest annual growth rates were found with at ages 12 - 13 by males and at 11 - 12 by females. The age of cross over between to sexes is between 9.5 to 12.5 years where upon female out growth male. Growth of Koreans in terms of sitting height increase prevailed over that of the Japanese at throughout all period of age in the case of the males and females.

2. **Physical and Nutritional Indices**

a) Relative Body Weight

The smallest values of relative body weight was obtained with both boys and girls aged 6, which was found to be increasing rather slowly thereafter with advancing ages. In relation to the pattern of growth of relative body weight, the picture was found to be similar to the cases of body weight.

b) Relative Chest Girth

The status of narrow relative chest girth were observed at ages 6 - 13 by the males and at 6 - 12 by the females, which were found to be normal relative chestgirth there after with advancing ages. The age of cross over between to sexes is between 10.5 to 21.5 years where upon female out growth male.

c) Relative Sitting Height

The largest values of relative sitting height were obtained with both boys and girls aged 6, which were found to be declining rather slowly thereafter with advancing ages. Throughout all period of growth girls demonstrated their superiority in terms of relative sitting height to boys.

d) Vervaeck Index

Rapid growth of the physical and nutritional status in terms of Vervaeck Index was found to be similar to the cases of relative body weight.

The values of Vervaeck Index were obtained with in the range of 74 - 91.5 in case of males and 73 - 88.5 in case of females throughout all periods. On the other hand, the smallest values of Vervaeck Index were obtained with both boys and girls aged 6, which were found to be increasing rather slowly thereafter with advancing ages.

e) Pelidisi Index

The values of Pelidisi Index of the nutritional status were obtained between 89 - 94 with both males and females.

f) Growth and Development Reflected by Röhrer's Index.

Physical growth gauged by Röhrer's· Index was found to be declining from 6 to 12 year of males and 6 to 11 years of females, which were found to be increasing thereafter with advancing ages. Throughout over 11 years of growth females demonstrated their superiority in terms of Röhrer index to males.

g) Growth and Development Reflected by Kaup Index.

The smallest values of Kaup Index wefe obtained with both boys and girls aged 6, which were found to be increasing rather rapidly thereafter

with advancing ages.

h) Quetelet Index of Physique.

The same values of Quetelet Index were obtained with both boys (140) and girls (140) aged 6 - 11, which were found to be increasing rather rapidly thereafter with advancing ages.

3. Body Volume

Rapid growth, in terms of Body Volumes measured with both boys and girls of various ages, which is described by a straight line on a growth curve, has been observed among both of sexes in the ages 7 - 15, as in the case of body weight. Growth of body volume was found to be slower among students of higher ages by both sexes. On the other hand, females were found to enter a rapidly growing stage one year earlier than the males.

4. Body Fat Weight and the Rate of Body Fat Weight.

a) Body Fat Weight

Body fat weight of male was of slow growth up to 12 with to range between 3.0 - 4.3 kg which was followed by rapid growth up to 17 (4.5 - 8.7kg) which inturn was followed by slow growth over 17 years old. In case of female body fat weight was of rapid growth up to 13 years old which was followed by slow growth between 11.0-12.4kg over 13 years old. Eventhough female had smaller body weight than male former demonstrated higher body fat weight than the later.

b) Rate of Body Fat Weight

The largest value of body fat weight (16.9%) was obtained with males aged 6, which was found to be declining rather slowly thereafter up to 12 years old (11.05%) which was followed by slow groth up to 15 years old (13.9%) which inturn was followed by slow growth over 16 years old. Meanwhile, the smallest value of body fat weight (15.3%) was obtained with females aged 6 in direct opposition to males, which was followed by slow down up to 15 years old (22.9%) which inturn was followed by slow growth over 16 years old.

With 13 - 15 percent of fixed body fat weight rate of male and 22 - 25 percent of fixed body fat weight rate of female, the result of present investigation conforms all the precedent of similar nature.