

EFFECTS OF PHYSICAL EDUCATION AND SPORTS PROGRAM ON DEAF PUPILS HEALTH-RELATED FITNESS: A CASE OF KAAGA SCHOOL FOR THE DEAF

R. H. Nkatha

Leisure and Recreation Department
Kenyatta University
P.O. Box 43844 Nairobi

Abstract

In this study, the health-related fitness levels of the deaf primary school pupils who participated in an eight week Physical Education and Sports program were measured using the American Alliance for Health, Physical Education, Dance and Recreation Physical Best Test. Kaaga School for the Deaf was purposely selected for the study. The sample comprised pupils in classes five, six and seven. A pre- and post-test design was used. A pre-test was carried out two weeks after opening school and a post-test eight weeks later, at the end of the treatment period. The dependent variables included low back flexibility, abdominal strength-endurance, cardiorespiratory endurance, percent body fat and upper body strength-endurance. The findings on the health-related fitness status of the participants showed that they had a lower fitness level during pre-test as compared to post-test. The study also established that in cardiorespiratory endurance and abdominal strength-endurance, boys performed better than girls. In low back flexibility, both girls and boys demonstrated an improvement at all ages. Results show that the deaf children's health-related fitness is improved by the Physical Education and Sports Program and indicates that the program could be used for the purposes of enhancing the deaf children's health status at all levels of the education system.

Key Words: Deafness, Health-related fitness levels, Physical Education and Sports Program

Introduction

Physical fitness is a state of well-being that allows people to perform daily activities with vigor, reduce

the hypokinetic problems and establish a fitness base for participation in a variety of physical activities (Safrit and Wood, 1995). Health fitness is important for all individuals throughout their lifespan and should be developed in all populations.

Fitness also, is a social-cultural phenomenon (Sherill, 1993). Societal expectations partly determine fitness aspirations for various people. Persons with disabilities and health impairments have to work harder at fitness than their able peers. Persons with disabilities, according to Auxter et al. (1989) need the best possible physique and exemplary fitness to overcome discrimination and obtain social acceptance.

Auditory handicap makes individuals withdrawn and inactive (Sherill, 1993). Attempts to communicate with others can be unsuccessful and frustrating; and the auditory handicapped find it difficult to participate in physical activities. Thus, the role of play, which is important to the social, psychological and motor aspects of development in typical children, is usually limited for the deaf children. The Physical Education and Sports program is an excellent means of integrating the deaf student into social situations in which he or she can achieve some success and group approval in situations in which ability speaks for itself, thus providing the opportunity for the much needed social interaction (Arnheim, 1995).

Modern living shows an increase in sedentary pursuits resulting in an ever-increasing hypokinetic conditions in persons with disabilities. Physical education activities are basic for the development and maintenance of the body (Werner, 1986) and thus, should be availed to everyone. Physical Education and Sports programs in schools should have the goal of enabling the disabled to make use of physical activities to enable adaptation to social life, community living and recreational environments (Toluhi, 1980). There is, therefore, a need to establish the effectiveness of the Physical Education and Sports program in improving the health-related fitness levels of the deaf students.

HYPOTHESES

The following hypotheses were tested:

- i) There would be no significant effect of the Physical Education and Sports program offered to the deaf primary school students on their health-related fitness levels in the areas of:
 - low back flexibility
 - abdominal strength-endurance
 - cardiorespiratory endurance
 - percent body fat
 - upper body strength-endurance.
- ii) There would be no significant relationship between gender and the effects of the Physical Education and Sports program on health-related fitness levels of the deaf primary school pupils.

- iii) There would be no significant relationship between age and the effects of Physical Education and Sports program on health-related fitness levels of deaf primary school pupils.

METHODOLOGY

A pre- and post-test design was used in the study. Pre-test and post-test data treatment of the case group was done which involved three stages: Pre-test, participation in Physical Education and Sports program and post-test.

The dependent variables included low back flexibility, abdominal strength-endurance, cardiorespiratory endurance, percent body fat and upper body strength-endurance. In order to establish entry status at the start of the program, a pre-test was done at the beginning of the term after the subjects had returned from a four-weeks' school vacation. The pupils were then exposed to the Physical Education and Sports program for eight weeks. A post-test was administered after the program to determine any changes.

Population

There were 25 schools for the deaf in Kenya at the time this study commenced. Pupils at the Kaaga School for the deaf were purposely selected as the target population. The school's population of 132 pupils gave the researcher access to a relatively high concentration of deaf pupils in a central area.

Sampling and Sampling Technique

The pupils in classes five, six and seven who were 11, 12 and 13 respectively were purposively sampled for the study. Pupils in class four were used for the pilot study.

Instruments for Data Collection

A battery of tests was used to evaluate the health-related fitness levels. The tests were administered according to the AAHPERD's 1988 Physical Best Test manual, of which its use is recommended amongst all populations including those with disabilities. Over the 8-week period, the subjects participated in the physical education lessons during regular learning sessions.

Procedure for Data Collection

Prior to the collection of data permission was sought from the head of the school to carry out the study at the school. Facilities, equipment and record sheets were prepared before the actual date of testing to enhance the reliability of the results. Physical education teachers were trained as assistants, in testing of low back flexibility, abdominal strength-endurance, cardiorespiratory endurance, percent body fat and upper body strength-endurance. Sign language was used to give test instructions. Testing of subjects was done per classes to facilitate efficient administration of tests. A pre-test was administered prior to the Physical Education and Sports program on the various health-related fitness components of low back flexibility, abdominal strength-endurance,

cardiorespiratory endurance, percent body fat and upper body strength-endurance during the first two weeks of the school term. The subjects were then exposed to the Physical Education and Sports program for a period of eight weeks. The post-test was conducted at the end of the eight weeks.

Data Analysis

All the pupils, 36 in total, attended all the lessons and sports sessions and their pre- and post-tests results on health-related fitness levels were used for data analysis. The data were subjected to statistical analysis using the computer sub-programs in the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were computed to get the mean, standard deviation and percentages for each component of fitness (low back flexibility, abdominal strength-endurance, cardiorespiratory endurance, percent body fat and upper body strength-endurance). The Pearson's correlation coefficient was used to test the relationship between the effects of Physical Education and Sports program on the health-related fitness levels of the deaf pupils and the dependent t-test was also used to compare the pre-test and post-test results on the same components.

RESULTS

The results of this study are shown in Table 1. The overall fitness of the participants was recorded both at pre-test and post-test. There was an overall improvement in the low back flexibility, abdominal

strength-endurance, percent body fat, cardiorespiratory endurance and upper body strength-endurance. The overall findings on the

health-related fitness status of the participants showed that, the participants had a lower fitness level during pre-test as compared to post-test.

Table 1 Overall Fitness of the Participants (N = 36)

Variable(s)	Pre-test		Post-test		T-Value	Pearson Correlation
	Mean	Standard Deviation	Mean	Standard Deviation		
Weight (cm)	40.6	7.2	40.2	7.1	0.18	0.97
Heart rate (bpm)	66.9	6.9	65	4.0	0.09	0.4
Balance (seconds)	4.1	3.3	4.9	2.6	0.13	0.5
Low back flexibility (cm)	9.7	5.1	11.9	4.3	0.00	0.8
Abdominal strength-Endurance (counts)	20.4	5.9	23.1	7.4	0.01	0.7
Cardiorespiratory Endurance (mins)	7.7	1.1	6.8	0.9	0.00	0.0
Skinfold Measurements (mm)	18.0	7.3	16.9	6.6	0.04	0.9
Upper body Strength-endurance						
Girls (secs)	8.9	5.2	12.8	17.1	0.29	0.54
Boys (counts)	3.9	3.5	5.7	3.6	0.00	0.94

This study also established that in cardiorespiratory endurance and abdominal strength-endurance, boys performed better than girls. In low back flexibility, both girls and boys demonstrated an improvement at all ages. The 16 to 19 year-old children improved significantly in the abdominal strength-endurance more than the 12 to 15 year-old children. 12 to 15 year-old children however, showed a greater improvement in cardiorespiratory endurance than the 16 to 19 year-old children.

DISCUSSION

Though there was some improvement in the participants' standing stork balance means, there

was no significant difference between the pre- and post-tests results. Auxter et al. (1989) note that, deaf children experience difficulties with balance since the inner ear, containing the vestibular apparatus helps in equilibrium maintenance. Little wonder then that the eight-week Physical Education and Sports program did not have significant improvement on the participants' balance.

Increased flexibility was indicated by the ability to reach a longer distance during the sit-and-reach test. The participants improved in trunk flexion after the eight-week Physical Education and Sports program. Both girls and boys portrayed a

significant change in their low back flexibility after the eight weeks period of Physical Education and Sports. There was also a significant difference between the pre-test and post-test results in the participants' low back flexibility according to age. These findings agree with those by Wasonga (1989) and Kinoti (1998). Wilmore and Costill (1994) indicate that physical activity improves trunk flexion and flexibility is lost easily during periods of inactivity and significant changes in flexibility occur in 5 to 15 weeks in joints exercised.

Increased number of sit-ups per minute indicated an increase in the ability to continue repeated contractions. The participants in this study performed more sit ups during post-test as compared to pre-test. This reflects that the Physical Education and Sports program improved the participants' abdominal strength-endurance after the eight weeks exercise period. Boys demonstrated a significant improvement in their abdominal strength-endurance. However, girls did not portray a significant improvement after the eight weeks period of Physical Education and Sports program. There was a significant difference in the abdominal strength-endurance of participants aged 16 to 19 years. However, there was no significant difference between the pre-test and post-test abdominal strength-endurance of the participants aged 12 to 15 years. Studies have indicated that physical activity improves abdominal strength-endurance (Wilmore and Costill, 1994; Kinoti, 1998).

The participants who finished the 1-mile run-walk in the shortest time demonstrated a high cardiorespiratory function. There was a significant difference between the participants' pre- and post-tests results of cardiorespiratory endurance. Both girls and boys showed improvement in their cardiorespiratory endurance after the eight weeks period of Physical Education and Sports program. The 12 to 15 year-old children improved significantly in the cardiorespiratory endurance as opposed to the 16 to 19 year-old children. Wilmore and Costill (1994) indicates that physical activity improves cardiorespiratory endurance. The more efficient ones cardiovascular and respiratory systems are, the greater the amount of physical activity an individual can perform before fatigue and exhaustion occur.

Reduced percent body fat was indicated by lesser skinfold measurements. The results of the study indicate that the participants, collectively (girls and boys) improved in skinfolds fat measurement during the eight-week period of Physical Education and Sports program. The pre-test and post-test differences for boys and girls were not significant at 0.05 level. Both boys and girls at different age groups, did not show statistically significant changes in their percent body fat after the eight weeks of Physical Education and Sports program. Werner (1986) notes that it takes time to reduce body fat and an eight weeks duration generally would result in only small changes.

The results of the study showed that after the Physical Education and Sports program, there was improvement in the upper body strength-endurance of boys, and none in that of girls. Changes were noted however, among all participants, though they were not statistically significant for girls at 0.05 level. Katch and McArdle (1983) argue that tests for strength of boys and girls differ since boys have greater muscle mass, bigger shoulders, arm and trunk strength development than girls due to hormones. These findings concur with those of Wasonga (1989) in which boys performed significantly better in upper body strength-endurance.

CONCLUSION

The study noted improved performances in the health-related fitness levels of the deaf children after an eight-week period of Physical Education and Sports. Nolan and Tucker (1984) note that children who are deaf have reduced social contacts, which in turn leads to reduced opportunity to participate in sports. It is suggested that parents of the hearing impaired children be encouraged to set aside time each day to play with the child. The child should also have access to a rich variety of play materials with which he or she can engage in solitary or group play at home.

Activities on Physical Education and Sports for the hearing impaired pupils in Kenya are similar to those in the regular program. Hearing impaired pupils need individual assessment and programs that will meet their unique needs. Arnheim (1995)

notes that, the deaf children, whose problems are in the inner ear, have difficulties with accuracy, agility, balance and leg power. Well planned and supervised exercise programs are necessary for the deaf to help their motor functioning, as well as improving their coordination, balance and equilibrium.

RECOMMENDATIONS

1. Some theory lessons should be introduced for teaching in the Physical Education syllabus in order to teach the scientific and theoretical basis of health and physical fitness to pupils. This will help students appreciate and participate in Physical Education and Sports knowledgeably. It will thus be a source of motivation for better performance.
2. Physical Education and Sports should be encouraged in the schools for the deaf for the purposes of enhancing the deaf children's health status at all levels of the education system. Kenya Institute of Education (K.I.E.) should develop a suitable Physical Education syllabus geared towards improving the physical activities, which can enhance the deaf pupils health.
3. Adapted Physical Education courses in the higher institutes of education should introduce sign language for the deaf as one of the areas of competency.
4. Teachers of Adapted Physical Education should carry out periodical physical fitness assessment to establish the health status of the handicapped children in order to understand

the areas of strengths and weaknesses in their physical fitness; and provide appropriate remedial fitness programs.

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