



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2020; 7(5): 366-371
© 2020 IJPESH
www.kheljournal.com
Received: 29-06-2020
Accepted: 15-08-2020

Pawan Sharma
M.Phil Scholar, Physical
Education, Apex University
Jaipur, Rajasthan, India

Dr. Ramneek Jain
Associate, Prof, Department of
Physical Education, Apex
University Jaipur, Rajasthan,
India

Effect of physical activity program on health related physical fitness of intellectually disabled children

Pawan Sharma and Dr. Ramneek Jain

Abstract

Physical activity maintains our physiological functioning and shapes the anatomical structure of the human body, it is, thus, considered important for the intellectually disabled people. Various factors like rapid economic progress and development of automated technology have made our daily chores very easy. People have adopted westernized diet patterns and physical activity has lessened. Thus, physical activity can be considered as a therapy of physical human movements, unfortunately, physical activity is understood as a natural and basics of human body movements including the different skills, which helps human body to perform a specific task. The objective of the research was to determine the effects of Physical Activity Programme on health-related fitness of intellectually disabled children. The Brockport physical fitness test manual was implemented to conduct the study. For this study, two groups were formed i.e. the experimental and control group. Different variables of the health-related physical fitness i.e., aerobic functioning, body composition and musculoskeletal functioning were selected. Total 40 intellectually disabled children from Government Rehabilitation Institute of Intellectual Disabilities (GRIID) were determined as subjects through the purposive sampling technique. The students selected for the research were restricted to boys from the age group of thirteen to seventeen years suffering from one or other form of disability. They were divided equally into the two groups randomly. The objectives of the research were to study the impact of physical activity programme on dependant variables such as aerobic functioning, body composition or degree of body leanness or fatness, muscular strength, muscular endurance and flexibility or range of motion among intellectually disabled boys. Field experts and supervisors helped and guided in designing the physical activity programme which was implemented on the experimental group after a pre-test of both the groups, for complete twelve weeks. After its completion, the post-test was taken immediately. The significance of difference found in the pre-test and post-test mean score of each variable was evaluated using the paired „t” test. The significance of difference between pre-test and post-test mean score of the two groups was analyzed through independent t-test. The level of significance was set at 0.05 in order to find the dissimilarities, which could be considered significant. It was summarized that by implementing the physical activity programme, significant improvement was reported in the aerobic functioning, body composition and musculoskeletal functioning of boys with intellectual disability. With the help of physical activity programme and its findings, new innovative ideas can be formed in this field.

Keywords: physical activity, physical fitness, disabled children etc

Introduction

The physical activity is “any bodily movement produced by skeletal muscles that result in energy expenditure”. In general terms the fitness can be improved by increasing the usage of more amount of stored adenosine triphosphate (ATPs) of human body. Fitness term is also considered the most important term for the public health, which also includes the cardio respiratory endurance, muscle strength, agility, range of motion, balance and co-ordination (Caspersen, 1985). The physical activity should be treated as the therapy of physical human movements whereas it is understood that the physical activity is natural and basics of human body movements including the different skills which helps human body to perform a specific task (Disability Information Sheet, 2001). One of the research work advocated that the aquatic exercises are the one of the best exercises to improve the heart efficiency. Researcher also proved that aquatic exercises are the effective therapy for the heart disease which reduces the risk factor by enhancing the blood circulation positively (Ussher *et al.*, 2003). Persons with ID are usually suffering from many health problems and have high mortality rate and their life

Corresponding Author:
Pawan Sharma
M.Phil Scholar, Physical
Education, Apex University
Jaipur, Rajasthan, India

expectancy is shorter than the other normal people. However, in recent years, the lifespan of persons with ID have increased. These persons usually cope with many health issues of their age, and usually at initial years of age the success rates are higher. Researchers in the field of ID stress the importance of health issues and promotion interventions for persons with ID. Certain interventions and methods to Increasing physical activity (PA) are related to favourable health outcomes such as decrease in the risk of heart diseases, diabetes, cancer, diabetes, hypertension and obesity. According to the recommendation of World Health Organization (WHO) (2010), the adults between the ages of 18–64 are required to do at least 150 minutes of moderate-intensity PA in the week. Further, most of the studies indicates very low PA levels and have an inactive lifestyle among persons with ID (Capersen, 1985).

Relation of physical activity and health

A quick development in economics and modernization plays an important role behind the inefficiencies of children. The reason of these inefficiencies is that the people get adapted to new technologies which promote the easier way of livings comparatively. Obesity is a common problem among people with and without disability. Obesity effects negatively on the cardio system and also leads to some other major problems like type 2 diabetes and cancer. It was also found that the obese people with disabilities have greater risk than the people without disability (Hu *et al.*, 2005). Notwithstanding the restricted commitment in PA, grown-ups with ID have low cardiovascular wellness which starts at a youthful age and exacerbates with age. Likewise, when contrasted with the all inclusive community, individuals with ID perform worse than average in physical wellness tests. A longitudinal investigation of physical wellness (PF) shows an enormous decrease in grown-ups with ID than the typical grown-ups from the previous 13 years. An increments in weight and overwhelming level of muscle versus fat in guys is watched, while, females with ID demonstrate a decrease in cardiovascular wellness and sit-ups are seen. Moreover, people with ID are only efficient of their primary care which lacks proper living skills for daily life to live an independent life in the society, thus, making them live them in the community homes. Thus, the community home provides them 24 hour care and support and becomes a permanent home for them. Shockingly, people group home is a keeping set up in which inhabitants needs authorization to go out and this can diminish choices and open doors for PA and looking after PF. At present all through Hong Kong, 37 network (gathering) homes are working offering 2092 private offices for grown-ups with mellow and moderate ID. Among them dominant part of network homes (78%, 1744 inhabitants) are joined with shielded workshops which are put close-by or in similar structures. These shielded workshops fundamentally mastermind all day work for people with gentle and moderate ID when they complete their instruction in the unique schools.

Intellectual disability

Disability has often been reckoned as a personal „tragedy“ and solutions to this „tragic“ problem ought to be personal. However, this is nothing but parochial view of disability which leads to nowhere. Here, it becomes important to differentiate between impairment and disability. Disabilities have remained conspicuous since the dawn of civilization. However, human approach towards them has changed over different historical periods. In earlier times, it was assumed

that mental and physical impairments are the major root of the difficulties faced by people with disabilities. However, in present times, the conception of disability has changed completely. A leading social activist in United Kingdom, Paul Hunt argues that the impairment of certain function is not the only problem of disability faced by an individual but it also affects the area of our relationship with able bodied.

Objectives of the study

1. To examine the effects of physical activity programme on aerobic functioning among intellectually disabled boys.
2. To assess the effects of physical activity programme on the degree of body leanness or fatness among intellectually disabled boys.
3. To identify the effects of physical activity programme on muscular strength among intellectually disabled boys.
4. To examine the effects of physical activity programme on muscular endurance among intellectually disabled boys.
5. To explore the effects of physical activity programme on flexibility or range of motion among intellectually disabled boys.

Methodology

Selection of subjects to determine the effects of physical activity programme, 40 intellectual disabled boys from Government Rehabilitation Institute of Intellectual Disabilities (GRIID) were selected as subjects. The purposive sampling technique was used to select the subjects. The subjects were assigned arbitrarily to the experimental group (20) and the control group (20). The age of subjects ranged between 13 to 17 years.

Selection of variables

Dependent variable

The aim of the research was to access the health-related physical fitness of disabled children. Different variables related to the health-related physical fitness were considered with the consultation of the supervisor and subject experts. Extensive literature survey had been conducted. Many previously conducted studies like Vicente-Rodríguez, G. *et al.* (2010) investigated the “Health-related physical fitness in children and adolescents with Down syndrome and response to training” and Chen, W. *et al.* (2018) explored the “Health-related physical fitness and physical activity in elementary school students” also used the below listed variables to access the health-related physical fitness. Thus, the investigator selected the following dependent variables:

Aerobic functioning. Body composition. Musculoskeletal Functioning (Muscular strength and endurance), Musculoskeletal Functioning (Flexibility).

Independent Variable

A special physical activity programme for disabled children was constructed with the help of the supervisor, subject expert and through an extensive literature survey. This physical activity programme was implemented on the intellectually disabled children.

Tests / Tools used

The Brockport Physical Fitness Test (Winnick and Short 2014) specially constructed for the intellectually disabled children was selected for the study. The Brockport Physical Fitness Test provides a variety of test items to assess a specific variable. One recommended test item from given tests in each variable was selected and in addition, one

optional test item was also selected from the provided test items. Total seven test items were used to measure the score of Health-related Physical fitness of subjects for the present study.

Results and discussion

In this chapter, the interpretation of results, discussion of results and testing of hypotheses have been presented. The data pertaining to the aerobic capacity, body composition and musculoskeletal functioning collected from two groups of 20 subjects each have been presented in this chapter. The experimental group undertook physical activity program and the control group did not participate in any physical activity program. To understand the effects of above said program and to determine the significant differences between both the

groups on selected dependent variables, the pre-test and post-test means were compared. A paired t-test and independent t-test were employed.

Interpretation of results

The interpretation of results with regard to the variables aerobic functioning, body composition and musculoskeletal functioning in terms of significant differences, if any, between pre-test and post-test means for each group between experimental and control group after 12 weeks of physical activity programme have been presented in section-I and II. section- i pre-test and post-test mean scores between the experimental and control group of the health related physical fitness of intellectually disabled boys table - 4.1

Table 4.1: Significant differences between pre-test and post-test mean scores of the experimental and control group on the variable aerobic functioning (20 meter pacer test)

Groups	Pre Test		Post Test		Standard error of differences	t ratio	Sig.
	Mean	SD	Mean	SD			
Experimental	11.15	3.64	16.90	4.78	.81	7.09*	.000
Control	10.75	3.55	8.60	2.64	.38	5.57*	.000

* Significant at 0.05 level

df =19

Table 4.1 depicted the significant differences between the pre-test and post-test mean scores of the variable aerobic functioning (20 meter pacer test) of experimental and control group. The show that the aerobic functioning which was measured by 20 meter pacer test, had improved after undergoing 12 weeks physical activity programme as significant differences were reported between the pre and

post-test mean scores of the experimental group for the variable of aerobic functioning ($t=7.09, p<0.05$). Whereas, the pre and post-test mean scores of control group were also found to be statistically significant. However, while comparing the pre and post-test mean scores, it has been observed that the aerobic functioning of this group was decreased after passing of 12 weeks ($t=5.57, p<0.05$).

Table 4.2: Significant differences between pre-test and post-test mean scores of the experimental and control group on the variable aerobic functioning (vo2)

Groups	Pre Test		Post Test		Standard error of differences	t ratio	Sig.
	Mean	SD	Mean	SD			
Experimental	33.02	2.32	35.05	2.53	.28618	7.09*	.000
Control	32.33	1.77	31.56	1.54	.16202	4.74*	.000

Table 4.2 depicted the significant differences between the pre-test and post-test mean scores of the variable aerobic functioning (VO₂) of the experimental and control group. The outcomes of the research show that the aerobic functioning which was measured by calculating VO₂, had improved after the implementation of a 12 week physical activity programme as significant differences were reported between the pre and

posttest mean scores of the experimental group for the variable of aerobic functioning ($t=7.09, p<0.05$). Whereas, the pre and post-test mean scores of control group were also found to be statistically significant. However, while comparing the pre and post-test mean scores, it has been found that the aerobic functioning of this group was decreased after passing of 12 weeks ($t=4.74, p<0.05$).

Table 4.3: Significant differences between pre-test and post-test mean scores of the experimental and control group of the variable body composition (sum of triceps and calf)

Groups	Pre Test		Post Test		Standard error of differences	t ratio	Sig.
	Mean	SD	Mean	SD			
Experimental	27.45	6.41	23.17	6.08	.70	6.08*	.000
Control	24.15	4.75	25.60	4.96	.35	4.12*	.001

* Significant at 0.05 level

df=19

Table 4.3 depicted significant differences between pre-test and post-test mean scores of the experimental group ($t=6.08$, $p<0.05$) and control group ($t=4.12$, $p<0.05$) on the variable body composition (sum of triceps and calf). However, while comparing the pre and post-test mean scores, it has been

found that the body composition of control group was decreased after passing of 12 weeks. Overall results show that the body fat decreased in the experimental group and increased in the control group.

Table 4.4: significant differences between pre-test and post-test mean scores of the experimental and control group of the variable body composition (body mass index)

Groups	Pre Test		Post Test		Standard error of differences	t ratio	Sig.
	Mean	SD	Mean	SD			
Experimental	19.84	3.76	19.61	3.61	.09	2.67*	.015
Control	21.03	6.01	20.65	5.65	.19	1.97	.064

Table 4.4 revealed the significant differences between the pre-test and post-test mean scores of the variable body composition (body mass index) of the experimental group and insignificant differences in the control group of the variable body composition (body mass index). The outcomes of the research show the decreased mean after the 12 week physical activity programme implemented on the subjects which was calculated by height and weight, as significant differences

were reported between the pre and post- test mean scores of the experimental group of the variable body composition ($t=2.67$, $p<0.05$). In control group also, the mean decreased after the 12 week physical activity programme was implemented on the subjects which was also calculated by height and weight but was found insignificantly different ($t=1.97$, $p>0.05$).

Table 4.5: Significant differences between pre-test and post-test mean scores of the experimental and control group of the variable musculoskeletal functioning (flexed arm hang)

Groups	Pre Test		Post Test		Standard error of differences	t ratio	Sig.
	Mean	SD	Mean	SD			
Experimental	2.31	1.22	3.98	1.20	.25	6.73*	.000
Control	2.55	1.20	2.11	1.04	.11	4.06*	.001

* Significant at 0.05 level

df=19

Table 4.5 depicted the results were significantly different in mean scores of pretest and post-test of the variable musculoskeletal functioning (flexed-arm hang) of the experimental and control group. The results of the study show that the musculoskeletal functioning which was measured by flexed-arm hang, had improved after the implementation of the 12 week physical activity programme as significant differences were reported between the pre and posttest mean scores of the experimental group of the variable musculoskeletal functioning ($t=6.73, p<0.05$). Whereas, the pre and posttest mean scores of the control group were also found to be significantly different but the musculoskeletal functioning of this group decreased during the period of this experiment ($t=4.06, p<0.05$).

Findings

The analysis of paired t-test for the pre and post-test mean scores with regard to all the selected dependent variables resulted in significant „t“ ratios for the 2 groups. Section- 1 depicts the differences and compares the scores taken by both the groups of health related fitness. The outcome points out that the aerobic functioning had improved after the implementation of the programme as significant differences were reported between the scores of test of the experimental group ($t=7.09, p<0.05$) and the control group ($t=5.57, p<0.05$) of the variable aerobic capacity. In VO₂ max. the significant differences were reported between the pre and post test scores of the experimental group of the variable aerobic functioning ($t=7.09, p<0.05$). Whereas, both the tests were designed differently for the control group, the aerobic functioning of this group decreased after the treatment ($t=4.74, p<0.05$). Section- 2 presents the comparison between pre-test mean scores of both the groups and between post-test mean scores of both the groups of the variables of health related fitness. The research revealed that insignificant difference was reported between the pre-test mean scores of both the groups of the variable of aerobic functioning ($t=.35, p>0.05$). Whereas, significant differences was reported between the post-test mean scores of both the groups of the variable of aerobic functioning ($t=6.80, p<0.05$). An insignificant difference was reported between the pre-test mean scores of both the groups of the variable of aerobic functioning ($t=1.06, p>0.05$). But important differences were reported between the post-test

In body composition (sum of triceps and calf) the results showed decreased mean after the treatment implemented on subjects. Significant differences were reported between the pre and post test mean scores of the experimental group ($t=6.08, p<0.05$) and the control group ($t=4.12, p<0.05$) of the variable body composition. The outcomes revealed that the body fat decreased in the experimental group and increased in the control group. Body composition (body mass index) was reported as significantly different between the pre and post test means of the experimental group for the variable of body composition ($t=2.67, p<0.05$). Similarly, in the control group, the mean decreased after the twelve week physical activity programme was implemented on the subjects which was also calculated by height and weight but found to be insignificantly different ($t=1.97, p>0.05$). Section- 2 presents the comparison between pre-test mean scores of both the groups and between post-test mean scores of both the groups of the variables of health related fitness. Insignificant differences were reported between the pretest mean scores ($t=1.85, p>0.05$) and post-test mean scores ($t=1.38, p>0.05$)

of both the groups of the variable of body composition (sum of triceps and calf). Again, insignificant differences were reported between the pre-test scores ($t=.751, p>0.05$) and post-test scores ($t=.69, p>0.05$) of both the groups of the variable of body composition (body mass index).

For musculoskeletal functioning (flexed-arm hang), significant differences were reported between the prior and subsequent test scores of the experimental group ($t=6.73, p<0.05$) and the control group ($t=4.06, p<0.05$) by implementing the treatment. Section- 2 presents the comparison between pre-test mean scores of both the groups and between post-test mean scores of both the groups of the variables of health related fitness. In regard to musculoskeletal functioning (flexed-arm hang), an insignificant difference was reported between the pre-test mean scores ($t=.65, p>0.05$) and significantly different ($t=5.24, p<0.05$) for the post-test mean scores for both the groups.

The musculoskeletal functioning was (modified curl-up) found significantly different in the pre and post test mean scores of the experimental group ($t=8.15, p<0.05$). The control group also improved during the treatment, as significant difference was found between both the test mean scores of the variable musculoskeletal functioning ($t=2.53, p<0.05$). Section- 2 presents the comparison between pre-test mean scores of both the groups and between post-test mean scores of both the groups of the variables of health related fitness. For the variable of musculoskeletal functioning (modified curl-up), insignificant differences were reported between the pre-test mean scores of both the groups ($t=.89, p>0.05$). Whereas, significant differences were reported between the post-test mean scores of both the groups $t=3.97, p<0.05$.

In regard to musculoskeletal functioning (trunk lift), the results of the study show substantial differences in both the test mean scores of the experimental group ($t=9.88, p<0.05$), whereas, pre and post-test were found to be insignificantly different in the control group ($t=.77, p>0.05$). Significant differences were reported between the initial and subsequent-test mean scores of the first group of the variable musculoskeletal functioning (back-saver sit-and-reach) ($t=8.80, p<0.05$). On the other hand, the outcomes of pre and post-test were insignificantly different in the control group ($t=.66, p>0.05$). Section- 2 presents the comparison between pre-test mean scores of both the groups and between post-test mean scores of both the groups of the variables of health related fitness. For musculoskeletal functioning (trunk lift) an insignificant difference in the pre-test mean scores of both the groups ($t=.65, p>0.05$) was observed. Whereas, significant difference was reported between the post-test mean scores of both the groups of the variable of musculoskeletal functioning ($t=3.35, p<0.05$). In regard to musculoskeletal functioning (backsaver sit-and-reach), the findings of the study showed that an insignificant difference was reported between the pre-test mean scores of both the groups ($t=1.94, p>0.05$). However significant differences were reported between the posttest mean scores of both the groups of the variable of musculoskeletal functioning ($t=3.35, p<0.05$)

Conclusions

The following conclusions were drawn on the basis of findings of the research:

1. The Physical Activity Programme had significantly improved the aerobic functioning (20 meter pacer test) of

- the intellectually disabled children by implementing physical activity programme.
2. The Programme had significantly improved the aerobic functioning (VO₂ max.) of the intellectually disabled children by implementing physical activity programme.
 3. Significant decrease in the body composition (sum of triceps and calf skinfolds) was reported in the intellectually disabled children after the implementation of the treatment.
 4. It lead to significant improvements in the body composition (body mass index) of the intellectually disabled children.
 5. The musculoskeletal functioning (flexed arm hang) performance significantly increased by the implementation of the programme on the intellectually disabled children.
 6. The treatment had significantly improved musculoskeletal functioning (modified curl-up) performance of the intellectually disabled children.
 7. The musculoskeletal functioning (trunk lift) performance of the intellectually disabled children was found to be significantly improved after the completion of the Physical Activity Programme.
 8. There were significant improvements in the musculoskeletal functioning (back saver sit and reach) performance of the intellectually disabled children after its implementation.

References

1. Academic achievement at paramount high school. *Academic Leadership: The Online Journal*, 5, 1-8.
2. Adler PA, Adler, E. *Backboards and blackboards: Athletes and role engulfment*. New York: Columbia Press 2011.
3. *Analysis* (2nd ed.). Pacific Grove, CA: Duxbury Press 2011.
4. Aries E, McCarthy D, Salovey P, Banaji MR. A comparison of athletes and non-athletes at highly selective academic performance and personal development. *Research in Higher Education* 2004;45:577-604.
5. Athletes, but some critics argue that statistics show shortcomings in the treatment of black students.
6. Baucom C, Lantz CD. Faculty attitudes toward male Division II student-athletes. *Journal of Sport Behavior* 2000;24:265-279.
7. Beem K. Righting the balance in the athletics-academic equation: *The SchoolAdministrator*, 2006, 1-15.
8. Beets MW, Pitetti KH, Forlaw L. The role of self-efficacy and referent specific social support in promoting rural adolescent girls' physical activity. *American Journal of Health Behavior* 2007;31:227-237.
9. Beezley WH. Counterimages of the student athlete in football folklore. In W.L.Umphlett (Ed.) *American sport culture: the humanistic dimensions*. Lewisburg,PA: Bucknell Press 2015.
10. Broh BA. Linking extracurricular programming to academic achievement: Who benefits and why? *Sociology of Education* 2002;75(1):69-95.
11. Buck J. Jocks with juiced-up hearts. *Sporting News* 2004;11:1.