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Effects of Aerobic Exercise Programme on Quality of life of Intellectually Disabled Individuals in Ibadan, Nigeria

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ABSTRACT
The benefits of physical activities are universal for all including those with intellectual disability. Individuals with intellectual disability are mostly neglected and hardly exercised. Hence, the opportunities for improved health and wellness are limited. Paucity of data that could guide ameliorative measures also presents another challenge. Therefore, this study examined the effects of aerobic exercise programme on quality of life and physiological parameters of intellectually disabled individuals in Ibadan.
Pretest-posttest, control group experimental design was adopted for the study. Participants were 65 individuals with intellectual disability drawn from four schools for the handicap in Ibadan, and were assigned into three experimental groups (Down syndrome, Autism and Cerebral palsy) and control group. The interval training programme was adopted for the study. This was administered three times a week for ten weeks. The instruments used were: comprehensive quality of life scale (importance, r = 0.74 and satisfaction, r = 0.73). Hypotheses tested at 0.05 level of significance. Data were analysed using Analysis of Covariance, Analysis of Variance.
Aerobic exercise programme improves the productivity ($F_{(2, 62)} = 39.5$; $p < 0.05$), intimacy ($F_{(2, 62)} = 329.9$; $p < 0.05$), and emotion ($F_{(2, 62)} = 40.01$; $p < 0.05$). Aerobic exercise programme was effective in improving the quality of life of intellectually disabled individuals. Therefore, aerobic exercise programme should be an integral part of the physical education curriculum for the intellectually disabled individuals.
Key words: Intellectual disability, Aerobic exercise, quality of life.

INTRODUCTION

Intellectual disability is usually characterized by a low intellectual functioning level of intelligence quotient (IQ), mostly below 70-75 and this exists concurrently with significant limitations in two or more of the adaptive skills such as communication, self care, home living, social skills, community use, self direction, health and safety, functional academics, leisure and work (Merrick, 2004). Eni-Olorunda (2001) notes that of all the categories of children with special needs such as the deaf, the visually impaired, the learning disabled and the orthopedically impaired, intellectually disabled individuals are the most neglected. Mba (1995) points out that universally, families are concerned about their image in the society, and as such instead of identifying with their intellectually disabled children, prefer to hide them at home, which invariably contribute to their late recognition for education and physical activity. Merrick (2004) asserts that persons who are intellectually disabled have been found by many researchers to be a population with deficient physical fitness measures, which result from inactive lifestyle, lack of awareness of the positive effects of physical exercise and lack of motivation for any motor activity. According to Healthy Children 2010 Report (2002), the intellectually disabled are more unlikely to participate in sustained or vigorous and rigorous exercise than people without disabilities. Therefore, children with disabilities tend to be weaker and are more susceptible to early fatigue than their physically active peers. They have higher metabolic, cardio-respiratory and mechanical costs of mobility, which lead to early fatigue and decreased exercise performance.

There are three classes of the intellectually disabled: The Totally Dependent, The Trainable and the Educable (Mba, 1995). The Federal Government of Nigeria in the National Policy on Education (2004) classifies them as the bedridden, the trainable and the educable. Although there are different categories of intellectual disabilities, which include Down syndrome, Autism, Prader-Willi Syndrome, Williams Syndrome, Fragile X, Inborn Errors, Cerebral Palsy, Neural Tube Defect. Only Down syndrome, Autism and Cerebral palsy will be examined for the purpose of this study and this is because they are easily accessible in schools. Down syndrome is the most common and easiest to identify. It is a chromosomal condition of intellectual disability, which is as a result of genetic aberration, which leads to the formation of 47 chromosomes instead of the normal 46. The additional but unnecessary chromosome disrupts the normal development of the body and brain. However, to confirm Down syndrome in an individual, a chromosome test is carried out on the individual. Individuals suffering from Down syndrome are characterized by poor strength; poor muscle mass and high percent body fat and so are predisposed to cardiovascular health problems (Andriolo, 2007; Hernandez, 1996).

Autism is an abnormality that starts in early childhood with very debilitating effects on social and communicative skill development. The cause of autism is yet to be discovered, so it is not preventable and has no known cure or any effective treatment. Its symptoms are quite heterogeneous but involve deficits in social relatedness and communication. It also includes the presence of restricted interests and repetitive behaviours (Sigma & Spence, 2005).

Cerebral Palsy is basically a disorder of movement and posture due to non-progressive abnormality of the immature brain. It is a condition in which the part of the brain controlling movement and posture does not develop properly. Though the brain continues to develop into early adulthood, the crucial events of its development occur during intrauterine life and early childhood (Batshaw, 2000). Individuals with cerebral palsy have low physical work capacity and low aerobic power. However, work done by Maria, Stephen Jeffrey and Kharasch (2004) has discovered an increase in maximal oxygen consumption, physical work capacity and aerobic power after an aerobic training for intellectually disabled individuals.

Aerobic exercise can be sustained for a long period of time without a build-up of oxygen debt in the muscles (Wuest & Bucher, 2003). Aerobic exercises are physical activities where the predominant means of ATP (adenosine triphosphate) resynthesis is by aerobic metabolism provided by dynamic and continuous activities with large muscle groups (ACSM, 1998). Individuals with intellectual disability experience low level of work capacity, low peak oxygen consumption, low aerobic fitness scores because of the low cell count present in individuals with intellectual disability (Pitetti & Fernhall 2005; Fernhall & Otterstetter, 2003). Aerobic exercises are the best way of improving cardio-respiratory capacity and achieving maximal fatty acid oxidation in individuals with intellectual disability (Achten, 2003; Leijssen *et al*, 2002). It is an established fact that physical activity is directly related to perceived quality of life. Quality of life (QOL) is an overall sense of well-being. It is an individual's perception of their of their position in life in the context of the culture and value system in which he or she lives and relation to their goals, expectations, standards and concern (Wuest and Butcher,2003). Research in quality of life of the intellectually disabled was first promoted with the most vocal and capable individuals, namely, adults who were young with mild disabilities (Krykou, 2005).

METHODOLOGY

At the conceptualization of this study, an approval was obtained from the University of Ibadan Research Ethical Review Committee. The research design for this study was pretest, posttest control group experimental design. Participants were made up of purposively selected individuals who are intellectually disabled from Home School for the Handicap, Ijokodo, Cheshire Primary School, Poly Road, School for the Handicap, Gate and servant of Charity, all in Ibadan, Nigeria. Different categories of intellectual disability that were used include the Down syndrome, Autism and Cerebral Palsy this Children whose class of disability ranges between Mild (IQ 55-65) and Moderate (IQ 40-54) were further randomly divided into experimental and control groups. The descriptive statistics of mean, standard deviation, range and inferential statistics of analysis of covariance were used to analyze the obtained data at 0.05 alpha level.

Hypothesis Testing

Hypothesis 1:

There will be no significant difference in the productivity subjective quality of life Subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10 weeks of aerobic exercise programme.

Table 1: ANCOVA of Productivity Subjective Quality of Life of Subjects

Source of variation	SS	MS	Df	F	P	Remarks
Covariates	2763.6	2763.6	1	39.5	0.000	Sig.
Explained	3166.5	1583.2	2			
Residual	4330.3	69.8	62			
Total	7496.9		64			

Significant at 0.05 level

Table 1 shows an observed F-ratio (2, 62) = 39.5, P< 0.05 was significant. Therefore, the null hypothesis which states that there will be no significant difference in the productivity subjective quality of life of Subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10 weeks of aerobic exercise programme was rejected.

Hypothesis 2:
There will be no significant difference in the intimacy subjective quality of life of Subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10 weeks of aerobic exercise programme.

Tables 2: ANCOVA of Intimacy Subjective Quality of Life of Subjects

Source of variation	SS	MS	Df	F	P	Remarks
Covariates	4740.0	4740.0	1	329.9	0.000	Sig.
Explained	4864.1	2432.0	2			
Residual	890.8	14.36	62			
Total	5754.9		64			

Significant at 0.05 level

Table 2 shows an observed F-ratio (2, 62) = 329.9, P< 0.05 was significant. Therefore, the null hypothesis which states that there is no significant difference in the intimacy subjective quality of life of Subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10-week of aerobic exercise programme was rejected.

Hypothesis 3:
There will be no significant difference in the emotion subjective quality of life of subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10 weeks of aerobic exercise programme.

Table 3: ANCOVA of Emotion Subjective Quality of Life of Subjects

Source of variation	SS	MS	Df	F	P	Remarks
Covariates	1712.0	1712.0	1	40.01	0.000	Sig.
Explained	2057.8	1028.9	2			
Residual	2652.7	42.7	62			
Total	4710.6		64			

Significant at 0.05 level

Table 3 shows an observed F-ratio (2, 62) = 40.01, P< 0.05 was significant. Therefore, the null hypothesis which states that there will be no significant difference in the emotion subjective quality of life of subjects in the experimental and control group of intellectually disabled individuals in Ibadan after 10 weeks of aerobic exercise programme was rejected.

DISCUSSION

The result shows a significant improvement in the productivity, intimacy and emotion domain of the intellectually disabled individuals. During the programme, some were asked to take care of the equipment used, at some point arguments ensued as to who keeps some of the equipment used. To be productive is to produce good and useful thing out of something. At the pre-stage of the exercise, individuals with intellectual disability could not perform a simple task like catching a ball, throw a ball up and touching their body part, but as the exercise programme progresses, they could execute some of this task that seems difficult at the pre-stage. To be intimate is to have a close relationship. Exercise is a great contributory factor to a close personal relationship. Cooperation, familiarity and intimacy were noticed among them after sometime. After sometimes, they were forming factions to see how they could outshine one another. They were overexcited when their friends or someone in their faction is winning. The result revealed that exercise brings about an improvement in the emotion of intellectually disabled children. Individuals with intellectual disability show a strong feeling towards colleagues and also to themselves after been together as a result of exercise programme. The result of this work is consistent with the research by Lav, cummins & Macpherson, (2005) that used the personal well-being index for intellectually disabled to get domain rating range from 70.5 to 82.1, with a mean score of 77.08. The personal relationship and feeling part of the community domain has the highest mean scores. Also, the result obtained in the Victorian general population sample in which domain scores range from 75.3 to 83.7, with a mean score of 78.8 revealed an improvement in the quality of life of intellectually disabled individuals. A result from larger Australian sample domain also concurs with other findings as appreciable improvements were noticed in the ratings ranged from 72.4 to 80.1 with a mean PLW-ID of 77.6. Although more research is required

in the relationship between exercise and quality of life of intellectually disabled children, there appear to be good support for the comQOL-ID as a measure of subjective quality of life in most individuals with intellectual disability.

CONCLUSION

The benefits of physical activity are universal for all children including those with intellectual disabilities. Exercise should be for everyone because it provides an opportunity to develop an individual's full physical and mental potentials. An exercise routine or fitness plan can inspire a person with intellectual disability to overcome misperceived limitations and allow for the opportunity to experience true growth. This research has added to the body of knowledge and will undoubtedly support the fact that exercise is found as a veritable tool in improving quality of life of intellectually disabled individuals.

REFRENCES

Achten J. 2003. Maximal fat Oxidation during exercise in trained men. *International Journal of Sports Medicine* 24 (8): 603 – 608.

American College of Sports Medicine. 1998 The recommended quantity and quality of exercise for developing and maintaining fitness in healthy adults. *Medicine Science in sports*. 10, 12-15

Andriolo R.B., Dib E.R., Ramos L.R., Atallah A.N. & Silva E.M.K., 2007 *Aerobic exercise programmes for improving physical and psychological health in adults with Down Syndrome*. Available http//www. The cochranelibrary.com

Batshaw M.L. 2000.*Children with Disabilities* (4th Ed) Paul H. Brookes Publishing Co. Baltimore U.S.A.

Cummins, R.A 1997 Assessing quality of life for people with disabilities in R.I Brown (ED) *Quality of life for handicapped people* (2nd ed) PP 116-150 Cheltenham, England: Stanley Thomas

Eni-Olorunda, 2001 mainstreaming the educable mentally retarded into the regular education system: The Nigerian experience. *Journal of Special Education* Ibadan: University of Ibadan. Vol. 9, Number 1, pg 15-24.

Fernhall, B. M. 2003 Attenuated Responses to Sympatho excitation in individuals with Down syndrome. *Journal of applied Physiology*, 94, 2158-2165

Healthy Children 2010 report 2002 Washington, D.C: US Department of Health and Human Service, Office of Disease Prevention and Health Promotion.

Hernandez D & Fisher E.M.C 1996. *Down syndrome genetics: Unraveling a multifactorial disorder*. Illuman Molecular Genetics.

Lav, A.L.D., Cummins, R.A., &Mcpherson, W 2005 An investigation into the cross-cultural equivalence of the personal wellbeing index. Social Indicators Research, 72, 403-430.

Leijssen D. P. Saris, W. H., Wagenmakers A. J. Senden J. M.& Van Baak M. A. 2002. Effects of exercise training at different intensities on fat metabolism of Obese. *Obesity Research* 92 (3): 1300-1309.

Maria A. Fragala. Pinkham, Stephen M. Haley, Jeffrey Rabin &Virginia S. Kharasch 2004. *Guide to physical therapist practice*. 2nd ed. Physther. 81: 19 – 28

Mba, P. O. 1995. *Fundamentals of Special education and vocational rehabilitation*, Ibadan: Codat Press.

Merrick J. Kessel. S., Isakor E. & Lotan M., 2004. Physical fitness and functional ability of children with intellectual disability effects of a short – term daily treadmill intervention Zviauittman Residential Center, The millieshime campus, Elwyn, Jerusalem *ml-pt-rs @ netvision.net.il*.

National Policy on Education 2004 Federal Ministry of Education. NERDC Press, Yaba Lagos, Nigeria.

Pitetti, K.H., & Fernhall B. 2005. *Mental Retardation. In: Exercise Testing and Exercise Prescription for Special Cases*, 3rd edition. J.S. Skinner (Ed). Lippincott, Williams, & Wilkins: Baltimore, MD. pp. 392-403,

Sigma M. & Spence S. J. 2005. Autism and its impact on young children's social development. Encyclopedia on Early Childhood Development.*Available at:* http://www.excellence– early childhood ca/documents/Sigma-Spence ANGxp.pdf.

Wuest D. A. & Bucher C. A. 2003. *Foundations of physical Education, Exercise Science and Sport* McGraw – Hill Higher Education 14th ed.