

Original Article



Effect of Physical Exercise on the Motor Skills Acquisition among Pupils with Intellectual Disability

Authors' contribution:

- A. Conception and design of the study
- B. Acquisition of data
- C. Analysis and interpretation of data
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Abstract. Decrease in physical activities among pupils with intellectual disability has been noted to affect motor skill acquisition, thus the need to carry out a study on possible ways to improve motor skill acquisition is necessary, this is the purpose of this study; which is to examine the effect of physical exercise on motor skills acquisition among pupils with intellectual disability. Three research hypotheses were posed in this work. A 2x2 pre-post test control group quasi-experimental research design was used for this study. The population was all students with intellectual disability in Kwara State as a sample of 40 children from schools located in Ilorin West Local Government Area of the state were selected through the use of simple random sampling technique. The instrument used for this study was a researcher's designed rating scale. The rating scale had two section; section A contains the demographic information of the respondents such as gender, while section B contains 10 items which is a 3 likert scale, ranging from always, sometimes and never. The instrument was subjected to face and content validity by physical education teachers and experts in education. In order to determine the reliability of the instrument, the instrument was trial-test to 20 respondents who were not part of the sample size. Data collected were analyzed using frequency count, and percentage for the demographic information, while Analysis of Covariance (ANCOVA) was used for the research hypotheses. It is revealed that; physical exercise had significant effect on motor skills acquisition among pupils with intellectual disability, there was no significant effect of physical exercise on motor skills acquisition among pupils with intellectual disability based on gender and there was no significant interaction effect of physical exercise and gender on motor skills acquisition among pupils with intellectual disability. Thus, it can be concluded based on the findings of the study that, physical activities enhance motor skills acquisition among intellectually disabled pupils. Based on the findings, the study recommends among others that Sensitization of teachers should be regularly done in order to inform them of the importance of physical activities on learners with intellectual disability.

Keywords: intellectual disability; physical exercise; motor skills

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INTRODUCTION

Intellectually disabled individuals have with varying degrees of functioning, share common behavioural and psychomotor characteristics. A specially designed instructional approach and positive social attitude are necessary when dealing with this population. Research reveals that many of these individuals have developmental delays in the acquisition of basic motor skills. When compared as a group to their non-handicapped peers, intellectually disabled display low physical fitness, which affect their learning. The major difficulty these individuals are faced with stems from language comprehension barriers and their failure to grasp instructions. In addition, some possess physical characteristics, which pose constraints in learning and performing of motor skills.

The state of intellectual disability (ID), also referred to mental retardation or developmental disability, has likely been in existence since the beginning of human life (Carmeli, Imam, Bachar, Merrick, 2012). However, the definition used to describe this state of the behavior and the human potential of this group of individuals is constantly changing and has changed over the years. Advancement of research, practice and the emphasis on human rights contributed to a better understanding of human behavior. From the definition and interpretation of the term intellectual disability, one learns that the true potential of those with intellectual disability is untapped and maybe still unknown. Many intellectually challenged students display a wide range of behavior and abilities, depending on the level of intellectual functioning (mental age), chronological age and experience. There is a paucity of literature focusing on the students in the psychomotor domain.

Children with intellectual disorders show a delay on motor development with important impairments in adaptive functioning and daily living skills limiting their autonomy and independence as well as their participation in social activities (Ferreira-Vasques & Lamônica 2015). Increasing research has targeted the gross motor proficiency in Down syndrome (DS) people, a genetic syndrome characterized by intellectual disability (Alesi, Battaglia, Roccella et al 2014). In contrast little research has been produced on the relationship between motor and intellectual proficiency in population with borderline intellectual functioning (BIF).

Meegan, Maraj and Weeks 2006) opined that children with DS show a delayed motor development corresponding to an atypical cerebrum size and maturation disorders of central nervous system. Motor deficits in Down people population have been categorized by a rating scale and subdivided into: mild impairment characterized by motor patterns that are similar to those of children with typical development (TD); moderate impairment characterized by the ability to initiate, adapt, and maintain movements with minor efficiency, high motion, wide base of support, limited balance and insufficient muscle tone; severe impairment characterized by difficulty in initiating, adapting and maintaining movements, reduced balance, scarce muscle tone, and limited voluntary control (Palisano, Walter, Russell et al 2001)

The milestones of motor development are not normally reached but show a gap increasing with the growth and the complexity of motor tasks. Children with DS were found to achieve the fundamental motor skills of standing and walking between the ages of 18 months and 3 years old (14% by 18 months, 40% by 24 months, and 73% by 30 months) and the motor skills of running, walking up, and jumping between the ages of 3 and 6 years with improvement proportionally corresponding to the complexity of movement, the stability of support base, the rate of necessary motor control (Palisano, Walter, Russell et al 2001).

Croce and Horvat (2019) posited that motor skills are very important for the intellectually challenged and contribute to locomotion, daily living skills, play, leisure, recreation and vocational pursuits. Motor and physical skills are also important for health and well-being. The need to identify and improve the physical activity patterns of individuals with intellectual disabilities. Individuals with intellectual disabilities, who were not provided with

the opportunities to learn, exercise, and build work capacity, demonstrated lower levels of functioning (Croce & Horvat 2019). In addition to physical and health benefits, motor skills and motor activity also have social value. Physical and motor activities provide opportunities for gaining movement confidence, developing self-image, and being able to take appropriate risks in life.

Alghadir, Gabr and Al-Eisa (2016) noted that motor development and brain functions in healthy children and adolescents were shown to be correlated with active physical performance in healthy and ID children or adolescents with lower or poor motor functions. This was significantly associated with a sedentary lifestyle or low physical activity (Alghadir, Gabr, Anwer, Al-Eisa, 2016). It was reported that participation of individuals with ID to programmed physical exercise interventions with varying intensities may have a positive impact results upon motor functions, ID scores, and quality of their life (Canivez & Watkins, 2010). However, the physiological and biochemical effects of physical exercise on the status of intellectual abilities among young individuals still have to be fully elucidated. Therefore, this study aims to evaluate the effects of 12-weeks of aerobic moderate exercise on motor functions and oxidative stress in school children with intellectual disability. In addition, we would like to see if there is any correlation between ID scores, motor function performance. It is true that there is a dearth of significantly accumulated research on physical activity for persons with intellectual disabilities, in comparison to other groups of disabilities (Rimmer 2014).

In early childhood, physical activities serve as the platform for the development of motor skills essential for performance of activities of daily living, interaction and education achievement (Desforjes and Abouchaar, 2003). Motor skills development and learning in children increase rapidly within two to six years of age. Zwolinska, Podstawki and Monosielska (2014) reveal that children developed fundamental motor skills at a differentiated manner and those with ID may require early intervention programmes in which adults are involved. In their study, they assessed children with ID of age 5-6 years attending therapy on development movement. Results indicated significant influence on motor skills improvement in children who were accompanied by adult special educators and concluded that children with ID can greatly improve in their motor skills abilities if given a chance to be a part of early intervention program. Karpljuk, Masleja and Videmek (2012) involved individuals with intellectual disability in an eight-week martial art training programme. Results of a t-test showed statistically significant differences between the initial and final measurements of seven subsets of motor abilities. The results did not have significant magnitude of mean difference between control and experimental groups. This was an indication that the children with ID in the control and experimental groups received an equal guidance in organized programme of PA and the children had similar entry and exit behaviour. There was significant increase in motor ability performance after participating in the organized Physical exercise programme both in the experimental and the control group. Although mean differences were high among children with ID in the experimental group than those in the control group, this did not significantly differ in children's motor abilities. This was an indication that the groups of children with ID were homogeneous and equally benefited from the organized Physical exercise programme. However, cumulative mean scores were significantly higher among children with ID in the experimental group than those in the control. This was associated to the experimental group participating in the organized physical activity programme with children.

Alghadir, Gabr and Al-Eisa (2016) posited that there was no significant effect of treatment and gender on motor skills acquisition among intellectual disability. In this study it was also revealed that, there was no significant effect of physical exercise on male and female motor skills acquisition among intellectual disability (Alghadir, Gabr and Al-Eisa 2016).

Zwolinska, Podstawki and Monosielska (2014) also revealed that, motor skill are better acquired by male than their females counterparts.

A social attitude of equality and acceptance plays a major role in the successful inclusion of pupils with intellectual disability in society. Researchers agreed that the limitations mentioned above, affect the motivation of these individuals and lead to a lack of opportunity for regular participation in movement, physical activities and sports. This situation leads to low performance in the motor domain and in other areas as well. This article describes the Effect of physical exercise on the motor skills acquisition among pupils with intellectual disability.

Statement of the Problem

Over the years there has been decrease in students with intellectual disability activities in schools, most especially in the area of physical development. This prompted previous researchers in trying to solve the issue related to health education, gross motor skills, etc that promotes physical development for students with intellectual disability. It was reported that participation of individuals with intellectual disability to programmed physical exercise interventions with varying intensities may have a positive impact results upon motor functions, intellectual disability scores, and quality of their life's. However, the physiological effects of physical exercise on the status of intellectual abilities among young individuals still have to be fully elucidated. Therefore, this study aims to evaluate the effects of physical exercise on motor skills acquisition among pupils with intellectual disability. Also, there is limited number of empirical studies on physical exercise across the globe, leading to no empirical studies on the effect of physical exercise on motor skill acquisition among pupils with intellectual disability in the chosen location, based on literatures assessible to the researcher. Although previous researchers have carried on the use of different other strategies to improve motor skills acquisition, yet the issue among intellectual disability pupils still persist. This creates a knowledge gap that this study intends to fill by examining the effect of physical exercise on motor skill acquisition among pupils with intellectual disability in Ilorin West Local Government Area, Kwara State.

METHODOLOGY

A 2x2 pre-post test control group quasi-experimental research design was used for this study. The population was all students with intellectual disability in Kwara State as a sample of 40 children from schools located in Ilorin West Local Government Area of the state were selected through the use of simple random sampling technique. The instrument used for this study was a researcher's designed rating scale. The rating scale had two section; section A contains the demographic information of the respondents such as gender, while section B contains 10 items which is a 3 likert scale, ranging from always, sometimes and never. The instrument was subjected to face and content validity by physical education teachers and experts in education. In order to determine the reliability of the instrument, the instrument was trial-test to 20 respondents who were not part of the sample size. Data collected were analyzed using frequency count, and percentage for the demographic information, while Analysis of Covariance (ANCOVA) was used for the research hypotheses.

RESULT AND DISCUSSION

Table 1 shows the effect of treatment on motor skills acquisition among intellectual disability in Ilorin West Local Government Area, Kwara State There was significant main effect of treatment on motor skills acquisition among intellectual disability ($F(1;35) = 39.521, P < 0.05$). The hypothesis is therefore rejected in the light of the result since the significant value

(.000) is less than 0.05. This implies that treatment had significant effect of treatment on motor skills acquisition among intellectual disability in Ilorin West Local Government Area, Kwara State. Table 1 also revealed the effect of treatment on motor skills acquisition among intellectual disability based on gender in Kwara State. There was no significant effect of treatment on motor skills acquisition among intellectual disability based on gender in Kwara State ($F(1, 35) = 1.355$; $P > 0.05$). The hypothesis is therefore not rejected in the light of the result since the significant value (.252) is greater than 0.05. This implies that gender had no significant effect on motor skills acquisition among intellectual disability in Kwara State. Table 1 also revealed the effect of treatment and gender on motor skills acquisition among intellectual disability in Kwara State. There was no significant effect of treatment and gender on motor skills acquisition among intellectual disability in Kwara State ($F(1,35) = .467$; $P > 0.05$). The hypothesis is therefore not rejected in the light of the result since the significant value (.499) is greater than 0.05. This implies that treatment and gender on motor skills acquisition among intellectual disability in Kwara State.

Table 1. Summary of Analysis of Covariance (ANCOVA) showing the Main Effect of there treatment on motor skills acquisition among intellectual disability in Ilorin West Local Government Area, Kwara State

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	7303.045 ^a	4	1825.761	29.909	.000
Intercept	4485.160	1	4485.160	73.474	.000
Pretest	1.070	1	1.070	.018	.895
Main Effect					
Treatment	2412.529	1	2412.529	39.521	.000
Gender	82.696	1	82.696	1.355	.252
Two Way Interaction					
Treatment * Gender	28.484	1	28.484	.467	.499
Error	2136.555	35	61.044		
Total	175334.000	40			
Corrected Total	9439/6000	39			

a. R Squared = .774 (Adjusted R Squared = .748)

Table 2 revealed that the significant main effect exposed by table 4 is as a result the significant difference between physical activity and conventional method. Physical activity refers to experimental group, while conventional method is known as control group. This implies that those exposed to pause-prompt-praise approach physical activity (mean = 74.601) performed significantly better than those exposed to conventional method (mean = 46.155).

Table 2. Summary of Bonferroni's Poc Hoc Pairwise Comparison of the scores within the two groups

Treatment	Mean Difference	Experimental	Control Group
Physical activity	74.601	*	
Conventional Method	46.155		*

The findings from the analysis Table 6 indicated the calculated Chi-square value of 211.032 and the table value of 16.92 with the degree of freedom of 3 at 0.05 alpha level. Since the calculated value is greater than the table value, the null hypothesis is rejected. This means that the Appointment of board members have a significant influence on the management structure and performance of the players of Kwara United Football Club.

Discussion of findings

Based on the findings of this study, it was revealed that treatment had effect on motor skills acquisition among pupils with intellectual disability, this implies that, pupils with intellectual

disability can develop and acquire motor skills through physical activity. This finding supports that of Gaffar 2022, who revealed that there was significant effect of physical activities on pupils' gross motor skill acquisition. This finding also is in tandem to Zwolinska, Podstawki and Monosielska (2014) which revealed that children developed fundamental motor skills at a differentiated manner and those with ID may require early intervention programmes in which adults are involved. Results indicated significant influence on motor skills improvement in children who were accompanied by adult special educators and concluded that children with ID can greatly improve in their motor skills abilities if given a chance to be a part of early intervention program (physical activities). This finding negates Karpljuk, Masleja and Videmek (2012) which revealed that there was no significant difference between children with intellectual disability in the control and experimental groups who received an equal guidance in organized programme of physical activity and the children had similar entry and exit behaviour.

Secondly, the study revealed that there was no significant effect of treatment on motor skills acquisition among intellectual disability based on gender in Kwara State. This implies that, irrespective of male and female pupils with intellectual disability, physical activities enhances acquisition of motor skill. This finding supports Alghadir, Gabr and Al-Eisa (2016) which revealed that, there was no significant effect of physical exercise on male and female motor skills acquisition among intellectual disability.

Lastly, this study revealed that there was no significant effect of treatment and gender on motor skills acquisition among intellectual disability in Kwara State. This implies that, physical exercise and the two different gender (male and female) had the same effect on motor skills acquisition among pupils with intellectual disability. This finding supports Alghadir, Gabr and Al-Eisa (2016) posited that there was no significant effect of physical exercise on male and female motor skills acquisition among intellectual disability.

CONCLUSION

It can be concluded based on the findings of the study that, physical activities enhance motor skills acquisition among intellectually disabled pupils. Based on the findings, the study recommends the following: 1) Sensitization of teachers should be regularly done in order to inform them of the importance of physical activities on learners with intellectual disability, 2) School owners and administrators should consistently identify and provide suitable physical activities and sports that pupils with intellectual disability can participate in, 3) Male and female children with intellectual disability should be encouraged to use physical activities to enhance motor skills acquisition.

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