CHILD TO CHILD PHYSICAL ACTIVITY MANAGING PSYCHOSOCIAL BEHAVIOURS AMONG LEARNERS WITH SEVERE INTELLECTUAL DISABILITIES IN PRIMARY SCHOOLS IN SELECTED COUNTIES, KENYA

BY

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DECLARATION

I declare that this thesis is my original work and has not been presented in any other university for consideration. This research thesis has been complemented by referenced sources duly acknowledged, where texts including spoken words have been borrowed from other sources, including the internet. These are specifically accredited and references cited under anti-plagiarism regulations.

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DEDICATION

To my adorable mother Aurelia Wangui for her ceaseless prayer towards my success, to my late sister Priscillah who cherished my progress in all levels of education, my dear husband Daniel Thamaini and beloved children; Elizabeth, Aurelia, Jane and Anne who continued supporting me psychologically.

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ABBREVIATIONS AND ACRONYMS

ID	: Intellectual Disabilities
IDEA	: Individual with Disabilities Education Act
LWSID	: Learners with Severe Intellectual Disabilities
PA	: Physical Activity
PE	: Physical Education
SID	: Severe Intellectual Disability
SOK	: Special Olympics Kenya
SOI	: Special Olympics International
UNCRPD	: United Nations Convention on the Rights Persons with Disabilities
USA	: United States of America
WHO	: World Health Organization

ABSTRACT

The purpose of the study was to assess the effectiveness of child to child physical activity in managing physical and psychosocial behaviours of learners with severe intellectual disabilities. Objectives of the study were to: identify the psychosocial behaviours among learners with severe intellectual disabilities, explore the extent to which learners with severe intellectual disabilities are involved in physical activity, compare teachers and parents rating of the effects of physical activity on psychosocial behaviours of children with severe intellectual disabilities, determine the effects of child to child physical activity on physical activity levels of learners with and without intellectual disabilities, compare the gross and sensory motor skills performance of learners with severe intellectual disabilities, establish benefits derived by both learners with and without intellectual disabilities before and after organised child to child physical activity programmes and to establish the challenges faced by PE teachers when involving children with severe intellectual disabilities exhibiting psychosocial behaviours in organised child- to -child physical activities programme in primary schools in selected counties in Kenya. The study used a quantitative approach employing a single subject quasi-experimental research design. It also employed questionnaires and physical activity measuring tool (Pedometers) as research instruments in the study. The target population was 210 learners with severe intellectual disabilities and only 36(17.14%) of them and 36 learners without intellectual disabilities aged 10-15 years met the inclusion and exclusion criteria making a total sample size of 72. Other respondents include 36 PE teachers and 36 parents of learners with severe intellectual disabilities. A pilot study was conducted in three primary schools selected from three different counties. Cronbachs' alpha correlation coefficient of 0.70 was considered to be highly reliable at determining internal consistency. The actual data collection took 12 weeks. Psychosocial behaviour scales in PE teachers' and parents' questionnaires were used to establish learners' behaviour before (pre-test) and after (post-test). Data were analysed using the computer software programme SPSS version (22.0).Frequent identified behaviours among learners with severe intellectual disabilities included; physical activities skill deficit (94.4%), hyperactive (41.7%), withdrawal behaviours (22.2%), anger (25.0%), temper tantrums (19.4%) and screams (16.7%) among others. Learners with severe intellectual disabilities were less (11.1%) involved in physical activities. Inferential statistics by paired sample t-test showed a significant difference in behaviour change ($P < 0.05$) before and after PA intervention. There was a significant difference in the learner's physical activity performance of gross and sensory motor ($t=15.61$, $p=0.0001$) activities before and after the intervention. A simple linear regression showed a significant relationship ($R^{2=1}$) between regular child to child PA and the physical activity levels of learners with severe intellectual disabilities. It was concluded that child to child PA improved physical and psychosocial behaviours among learners with severe intellectual disabilities. The study recommends that policy formulators incorporate PA in the school curriculum to initiate child to child physical activity intervention programmes as a recreation to enhance physical and psychosocial behaviour management.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This chapter entails the background to the study and statement of the problem. It further includes the purpose of the study, the objectives of the study as well as research questions. The chapter also highlights the significance of the study, delimitation and limitations. Finally, the study assumptions, theoretical and conceptual framework, as well as the operational definition of terms are explicated.

1.2 Background to the Study

Child to child physical activities is a global concept where learners with and without disabilities are encouraged to play together either in a home or a school set up (Ringland, 2019). The approach emphases children participation while adults facilitate. Most importantly, child to child principles deeply values and encourage their involvement as active members in the society. The child's interests are given priority in this programme. This means it does not entail ideology emphasize the practical world of programmes and projects by the children and not for the children. It captures and integrates both health and education seamlessly (Ringland, 2019). Many of the programmes around the world put more emphasis on clubs such as health, agriculture, drawing, and reading and neglect the aspect of physical activity and psychosocial behaviours.

The Individuals with Disabilities Education Act (IDEA) and Public Law 108-466 (2004) in the USA advocate for service to children and youth with disabilities aged 3-21 years. Therefore, it is very vital to involve learners with severe intellectual

disabilities aged 10-15 years in daily scheduled child to child physical activity. This will enhance their physical and psychosocial behaviour management altogether. The United Nations Convention on the rights of persons with disabilities (UNCRPD, 2006) represents the rights of people regardless of their state. This includes the right to sports activities which results from physical activity practice. Further, the US civil rights department advocate for persons with disabilities among who are children with severe intellectual disabilities. The emphasis is that they are served alongside their typically developing peers in and after – school athletics clubs. This, however, calls for competitions as opposed to physical activity engraved in the current study where an individual child does it freely for physical and psychosocial benefits purposes.

According to the Indian Asian Physical Activity Consensus (Misra et al., 2012), children and adolescent regular physical activity during a person's formative years is widely acknowledged as essential for healthy growth and development. It is even more beneficial when the regular physical activity helps in the management of psychosocial behaviours among children and adolescents. However, the consensus observes that many children and adolescents are less active than is recommended. Reduced activity levels limit motor skills development. Physical activity levels decline from childhood through to adolescent years (Misra et al., 2012). Children and adolescents especially those living with motor difficulties among whom are those with severe intellectual disabilities are often characterized by motor difficulties in both gross and sensory motor. Physical activity is necessary for the development of this. Having the opportunity to enjoy quality recreation is vital to the health and personal development of all individuals, regardless of disability or socio-emotional

status (WHO, 2017). Studies have confirmed that only about 20 % of high school students and adults were reported to get enough physical activity (Piercy, Troiano, Ballard, Carlson, Fulton, Galuska, & Olson, 2018).

This could be attributed to sedentary behaviours that result in obese among children with severe intellectual disabilities. Children with severe intellectual disabilities are said to be less physically active, living more sedentary lives with low fitness levels. They are therefore more likely to be overweight or obese than their typically developing peers.

To curb the problem of inactivity among people, the World Health Organization (2016) emphasizes the need for physical activity and other initiatives that reduce physical inactivity at national, regional and local levels. Its framework on school policy strengthens physical activity and recommends that schools and communities should implement programmes that promote daily physical activity and reduce sedentary behaviours among children. On the same concept, Americans came up with an external scientific advisory committee on Physical Activity Guidelines in 2018. It recommends that regular physical activities over months and years could produce long-term health benefits. Sadly, boarding institutions including special schools for learners with intellectual disabilities have increased the sedentary behaviours of children and adolescents. The problem is even worse when individuals with severe intellectual disabilities are concerned. They are termed as incapacitated or regarded as sick by the society. Consequently, they are not involved in physical education sessions unlike their peers with mild and moderate intellectual disabilities. Most learners with severe intellectual disabilities are left in classrooms or the dormitories during such exercise activities. It is in this context that European

countries are reporting less commuting to and from school (WHO, 2017). Limited access to physical activities impairs proper cognitive, social or emotional areas of functioning. Therefore, work on the motor areas serves both as a therapeutic and rehabilitative to psychosocial behaviours experienced by children and adolescents with severe intellectual disabilities (Bechar & Grosu, 2016).

Learners with severe intellectual disabilities exhibit a myriad of psychosocial behaviours including; social skills deficits, aggressive behaviour, withdrawal behaviour and anger among others (Ritchie, 2010). Challenging behaviours among children with severe intellectual disabilities have an external impact, such as aggression and destruction in the children themselves and the environment (Knapp, Adams, Handley, Doug, Walls & Jones, 2018). These challenging psychosocial behaviours are frequently exhibited by children with disabilities including those with severe intellectual disabilities.

Temple and Stanish (2011) report that peers performing physical activities together accrue many benefits. They include; learning new skills and making friends which significantly reduce personal barriers inclusive of psychosocial behaviours. Physical activity participation also benefits the psychological and sociological aspects of children with severe ID (Shea, Dawyer, Heeney, Simpson & Bulchela, 2010). Thus, child to child school-based physical activity programmes that involve learners with severe intellectual disability and their typically developing peers would help to improve their physical and psychosocial behaviours.

According to Einarsson et al. (2016), only 5% of Icelandic children and adolescents with mild to severe intellectual disability (6-16years) were achieving the recommended 60 minutes of the most vigorous physical activity (MVPA) every day. Bordenet (2016) says there is a need for interventions concerning physical activity with children with severe disabilities and those without disabilities. Further, the researcher denotes that low-level physical activity participation leads to high rates of other health problems. In the context of rehabilitation, the connection between physical activity and severe disabilities is important as it serves as a bridge beyond the physical limitations which individuals with disabilities experience in their lives. Bechar and Grossu (2016) stipulate that to help people with intellectual disabilities improve their motor skills. Therefore, training programs tailored towards their capabilities must be conducted to take advantage of their potential. Performing physical activities together leads to the acquisition of new skills and improved psychosocial behaviours among children with severe ID.

Handicap International Report (2015) in Bangladesh emphasized the use of an inclusive approach that promotes active participation and exercising PA to enhance self-esteem which is a psychosocial behaviour. However, Rout, Brunet, Range, Carbonneau and Julie (2015) reported that functional limitations among youth with disabilities are growing increasingly severe. This could be as a result of sedentary behaviours among this group and especially in special schools where children and adolescent are confined in classes, dormitories or the fields idling. Those with severe intellectual disabilities are more prone to this since they are termed as incapacitated to performance of activities.

Teachers interviewed denoted that organization of adapted physical activities becomes more complex because of the unique needs of youth with intellectual disabilities. As such many special schools have not borrowed the idea of involving children with severe intellectual disabilities in adapted physical activities (Rout et al, 2015). Individuals with intellectual disabilities require constant support in doing physical activities. This assistance would require adapted equipment, peer support motivation or time. In the current study learners with and without severe intellectual disabilities participated together in the organised chid to child physical activity programmes. Connell (2012) adds that it is important for children and youth with disabilities to participate in physical activities as this will enhance their social inclusion. This in turn enhances their physical and psychosocial behaviours the gap that has been left out

Sports act as a vehicle that ends stigma among persons with ID in Uganda (Handicap International Report, 2013). Salawu and Goon (2016) in a study done in King Williams Town, South Africa reports, that 96% of the children with severe mental disabilities have below-average gross- motor competences. Research among mild intellectual disability participating in sports (2,784 participants) aged between 16-91 years showed that 41% had done some form of sports activity before the study which denoted they are being involved more than those with severe intellectual disabilities. Odiango and Mse (2016) further add that in Uganda physical activity intervention improves social skill development levels amongst learners with intellectual disabilities.

Children and adolescents have the right to engage in play and recreational activities irrespective of their disabilities. However, many are the barriers that hinder their

participation. To overcome physical activity barriers, programmes that teach motor physical activities skills are needed hence, the intent of the current study to emphasize on gross and sensory motor skill training among learners with severe intellectual disability.

Special Olympics Kenya emphasizes that schools should provide learners with disabilities equal opportunity to participate alongside their peers (Bukhala, Onywera, Toriola, & Onagbiye, 2017). Participating in extra-curricular activities promotes socialization, improves social skills and changes physical activity behaviour when learners with intellectual disabilities are involved consistently in organized special Olympic programmes (Bukhala, 2012). However, physical inactivity is associated with psychological problems and is a major public health challenge in the developed world denoting it a global epidemic (Wachira, 2014). This prompted the researcher to want to assess the effectiveness of child to child physical activity in managing physical and other psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected Counties, Kenya.

1.3 Statement of the Problem

Participation in play activities is much lower and undetermined among children with severe intellectual disabilities, especially in an integrative setup. Managing the children's with severe intellectual disabilities psychosocial behaviours using evidence-based regular physical activities is limited as well. Therefore, Staurt (2017) advocate that PA in children should be practised in community integrations including schools to better their living. Mwangi (2016) notes that children with intellectual disability have low-level involvement in play with peers both at school

and at home. Further, the researcher reports that peers without intellectual disabilities do not include those with SID in their play activities. Subsequently, these children remain withdrawn during peer play activities. Moreover, learners with severe intellectual disabilities are also said to be subjected to a great deal of deprivation as a result of ignorance and unrealistic demands by parents, teachers and the entire community. They are therefore left without any form of meaningful intervention (Ncube, 2014). School environments are not providing opportunities for more play activities and even when they do, individuals with severe intellectual disabilities are denied an opportunity to enjoy an organized physical activity programme.

The current curriculum developed by the GoK (2017) through Kenya institute of curriculum development(KICD) for learners with special needs does not include periods for organised physical activities programmes for learners with severe intellectual disabilities. Rather they have sensory motor integration as a learning area to be taught to learners and it incorporates many aspects together. The current study initiates child to child physical activities as recreation for learners with severe intellectual disabilities and singles out the best physical activities that can bring enjoyment in an inclusive set-up. The recent foundation level curriculum designs (GoK, 2017) for learners with special needs do not either cater to the management of the psychosocial behaviours of learners it purports to cater for. This leaves out teachers with heavy tasks of trying to come up with effective strategies in the management of learners with severe intellectual disabilities psychosocial behaviours.

In the context of rehabilitation, the connection between physical activity and disabilities is important as it serves as a bridge beyond the physical and psychosocial behaviour limitations. This can always be practical with the inception of the organised child to child physical activity programmes. However, child to child physical activity programmes at school level involving learners with and without severe intellectual disabilities have not been established yet. Similarly, management of learners with severe intellectual disabilities psychosocial behaviours has also not been established. This prompted the researcher to assess the effectiveness of organised child to child physical activities programme in managing physical and psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya.

1.4 Purpose of the Study

This study sought to assess the effectiveness of organised child- to -child physical activity programme in managing physical and psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya.

1.5 Objectives of the Study

Objectives of the study were:

i. To identify the psychosocial behaviours of learners with severe intellectual disabilities given by teachers and parents before organised child -to- child physical activity programmes in primary schools in selected counties in Kenya.

ii. To explore the extent to which learners with severe intellectual disabilities are involved in child to child physical activity programmes in primary schools in selected counties in Kenya.

iii. To compare teachers and parents rating of the effects of physical activity on psychosocial behaviours of learners with severe intellectual disabilities before and after organised child to child physical activity programmes in primary schools in selected counties in Kenya.

iv. To determine the effects of child to child physical activity on physical activity levels of learners with and without intellectual disabilities before and after the organized child to child physical activity programmes in primary schools in selected counties in Kenya.

v. To compare the gross and sensory motor skills performance of learners with severe intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

vi. To establish benefits derived by both learners with and without intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

vii. To establish the challenges faced by PE teachers when involving learners with severe intellectual disabilities exhibiting psychosocial behaviours in organised child- to -child physical activity programmes in primary schools in selected counties in Kenya.

1.6 Research Questions

The main research question for the study was;

How effective is an organised child- to- child physical activity programme in managing the psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya?

The Sub- research questions include;

i. What psychosocial behaviours do teachers and parents identify among learners with severe intellectual disabilities in primary schools in selected counties in Kenya?
ii. To what extent are learners with severe intellectual disabilities involved in physical activity programmes in primary schools in selected counties in Kenya?
iii. How do teachers and parents' rate the effects of child to child physical activity on psychosocial behaviours among learners with severe intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya?
iv. What was the effect of regular physical activities on the physical activity level of both learners with and without severe intellectual disabilities before and after child to child physical activity programmes in primary schools in selected counties in Kenya?
v. What was the performance of gross and sensory motor physical skills of learners with severe intellectual disabilities and how did it compare before and after child to child physical activity programmes in primary schools in selected counties in Kenya?

vi. What benefits were derived by both learners with and without severe intellectual disabilities after participating in the organised child- to -child physical activity programmes in primary schools in selected counties in Kenya?

vii. What were the challenges faced by PE teachers when involving learners with severe intellectual disabilities exhibiting psychosocial behaviours in the organised child- to- child physical activity programmes in primary schools in selected counties in Kenya?

1.7 Research Hypothesis

According to Creswell (2005), hypothesis is the statement that establishes the prediction of the collected data. Hypothesis can be null or alternative Hypothesis. They are the most used compared to questions but can be used both (Creswell, 2005). The current study adopted the idea of using both.

H01. There is no significant difference between teachers and parents rating of the effect of child to child PA on psychosocial behaviours among learners with severe intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

H02. There is no significant difference between physical activity levels of learners with and without severe intellectual disabilities before and after the organised child-to- child physical activity programmes in primary schools in selected counties in Kenya.

H03. There is no significant difference in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after the

organised child to child physical activity programmes in primary schools in selected counties in Kenya.

1.8 Assumptions of the Study

The researcher assumed that there would be learners with severe intellectual disabilities in the selected schools. This is because the researcher had worked in two of the counties earlier on and was sure such learners existed. Teachers and parents were also hoped to provide observational information of the learners with severe intellectual disabilities psychosocial behaviours and interaction before and after the current study organized physical activities programme. Another assumption was that teachers would help to involve learners with severe intellectual disabilities in organized child to child physical activity programme. Further, it was assumed that, the study would be beneficial to learners with severe intellectual disabilities in managing their psychosocial behaviours.0

1.9 Limitations of the Study

The study encountered some limitations. They included a negative attitude from society towards learners with severe intellectual disabilities. This hindered some of the typically developing learners from participating in the organised child to child physical activity programmes in the current study. However, this was done voluntarily to carter for this limitation. Some teachers were not willing to train physical activities to learners with severe ID since they were only used to training learners with moderate intellectual disabilities as it was indicated in the current study findings (Table 4.7). This is because of the assumption that learners with severe intellectual disabilities are not able to follow instructions. To cater for this limitation only P.E teachers who had been trained as coaches by Special Olympics

Kenya were involved since they had hands-on experience and self-willed to be involved. Some teachers also did not schedule a time for PA because they said involving learners with severe ID could consume a lot of time and energy as indicated in the findings. However, the involvement of the research assistants together with the researcher motivated them and soon agreed to. Bringing regular learners together with those having severe ID was not welcomed by some parents of the typically developing learners due to the negative attitude towards disability. This was indicated in the current study findings when the P.E teachers reported the challenges they experienced involving both learners with severe intellectual disabilities and their typically developing peers in the organized child –to-child PA programme. To curb these parents of learners with severe intellectual disabilities were asked by the researcher to request parents whose children were without disability as friends. This allowed their children to partner with those with severe intellectual disabilities. This was a success since children who were friends with those with severe intellectual disability volunteered willingly without fear of their parents.

1.10 Delimitations of the Study

The researcher delimited the study to learners with severe intellectual disabilities. The study was also delimited to both special and regular primary schools. The schools were from Kiambu, Laikipia and Murang'a counties in Kenya. Three special schools and three regular primary schools were selected from each county totalling to 18 schools. Learners from regular primary schools included were classes 5 and 6. The schools were chosen because they provided an aspect of a special school neighbouring a regular primary. This enabled easy coordination between the two

schools. This also helped in creating peer support in the child to child physical activity programme for the current study.

1.11 Significance of the Study

Realizing that physical inactivity is a global public health problem which has been linked to many of the most terminal diseases (Wachira, 2014), the findings of this study would advocate for child to child programmes as an intervention to improve physical and psychosocial behaviours among learners with severe ID. Teachers would be made aware of the need to emphasize child to child physical activities in school set-ups. Also, the study hopes to develop new and innovative interventions of using child to child physical activity programmes involving learners from both special and regular primary schools. This study is also envisaged to accumulate knowledge and information that policymakers in Kenya and other countries may use as a springboard for the formulation and amendment of policies and legislation on the provision of physical activities recreation to learners with severe intellectual disabilities. The study also anticipated to add to the limited literature base on the effectiveness of organised child to child physical activity programmes in managing the psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya and elsewhere.

1.12 Theoretical Framework

The study used a theoretical framework which was strengthened by its consumption of the conceptual framework. Details of these are presented herein.

The study was guided by the seven tenets of applied behaviour analysis (ABA) theory of 1968. Applied behaviour analysis (ABA) refers to a systematic approach

to understanding behaviour. It is deeply rooted in the early work of Thorndike, Watson, Pavlov, and Skinner (1953) on the respondent and operant conditioning. ABA uses scientific observations and principles of behaviour to improve and change the behaviours of social interest. As a practice, ABA refers to the application of behaviour analytic principles to improve socially important behaviours and is especially important in the field of developmental disabilities. Behaviourists believe that the function of response is largely determined by environmental events that occur in close physical and temporal proximity to the behaviour. Applied behaviour analysis (ABA) involves systematically applied interventions through a process. This is destined to improve the socially significant behaviours to a meaningful degree of change which will confirm that the intervention employed caused the behaviour to improve or change. ABA theory focuses on solving problems of social importance using principles and procedures of behaviour analysis. That means interventions go through stages, unlike an experiment which involves a control group (Baer, Wolf & Risley, 1968).

The seven tenets of applied behaviour analysis are stipulated here. The first and foremost is **applied** behaviour that must be socially acceptable. Secondly, the **behaviour** function must be identified by manipulating environmental events as independent Variables (in this study -physical activities) and observing changes in behaviour as the dependent variable (in this study-physical and psychosocial behaviour). Third tenet emphasis is the aspect of **analytic**. This means when the behaviour is treated, there is the use of objective and controlled single-case designs that permit a believable demonstration of the effectiveness of the intervention. This is reflected in the current study as physical activities intervention and the subject

became their own control. Fourth, it must be **technological** whereby emphasis is on selecting an appropriate design for evaluating a functional relation through technology. This means thoroughly and accurately describing their procedures when conducting experiments and implementing behavioural interventions. The information includes written procedural integrity data documentation that allows another reasonably competent applied behaviour analyst to replicate the study after reading these documents (Baer et al., 1987). In the current study this was employed with the use of pedometers gadget as technological devices to establish physical fitness. Data from questionnaires were also documented and other researchers can replicate it as well.

According to Fisher, Kelley and Lomas (2003), the assessments and interventions applied behaviour analysts implement are in nature. However, Baer et al. (1968) say these interventions and the approaches used to develop the interventions should be **conceptually systematic** making this a fifth tenet. This means that they are based on the basic behaviour principles that have been empirically validated over many years by scientists. While group experiments use inferential statistics to determine statistically significant differences between groups ABA determine the **effectiveness** of their procedures by evaluating their data often through visual inspection (Fisher, Kelley & Lomas, 2003). This sixth tenet checks whether the respondents find the behaviour change significant that is socially acceptable. In the current study, the P.E teachers, parents and the research assistants in collaboration with the researcher verified whether child to child physical activities had significantly changed the psychosocial behaviours of learners with severe intellectual disabilities. Lastly, the findings must be **generalizable** to other settings if the behaviours decreased to near-

zero at a clinic. In this study clinic is referred to as the organised child to child physical activity programme. In Kenya we have sports clinics where participants receive facilitation in various games and sports for learners with intellectual disabilities.

In the current study, physical activity was to cause an effect on psychosocial behaviours exhibited by learners with severe intellectual disabilities. This meant managing their psychosocial behaviours and improving their social interaction as well as their physical fitness. The effectiveness of the strategy would be replicated even after the intervention in another natural setting. The study adopted all the seven applied behaviour analysis tenets. This is reflected in the conceptual framework in figure 1.1.

1.13 Conceptual Framework

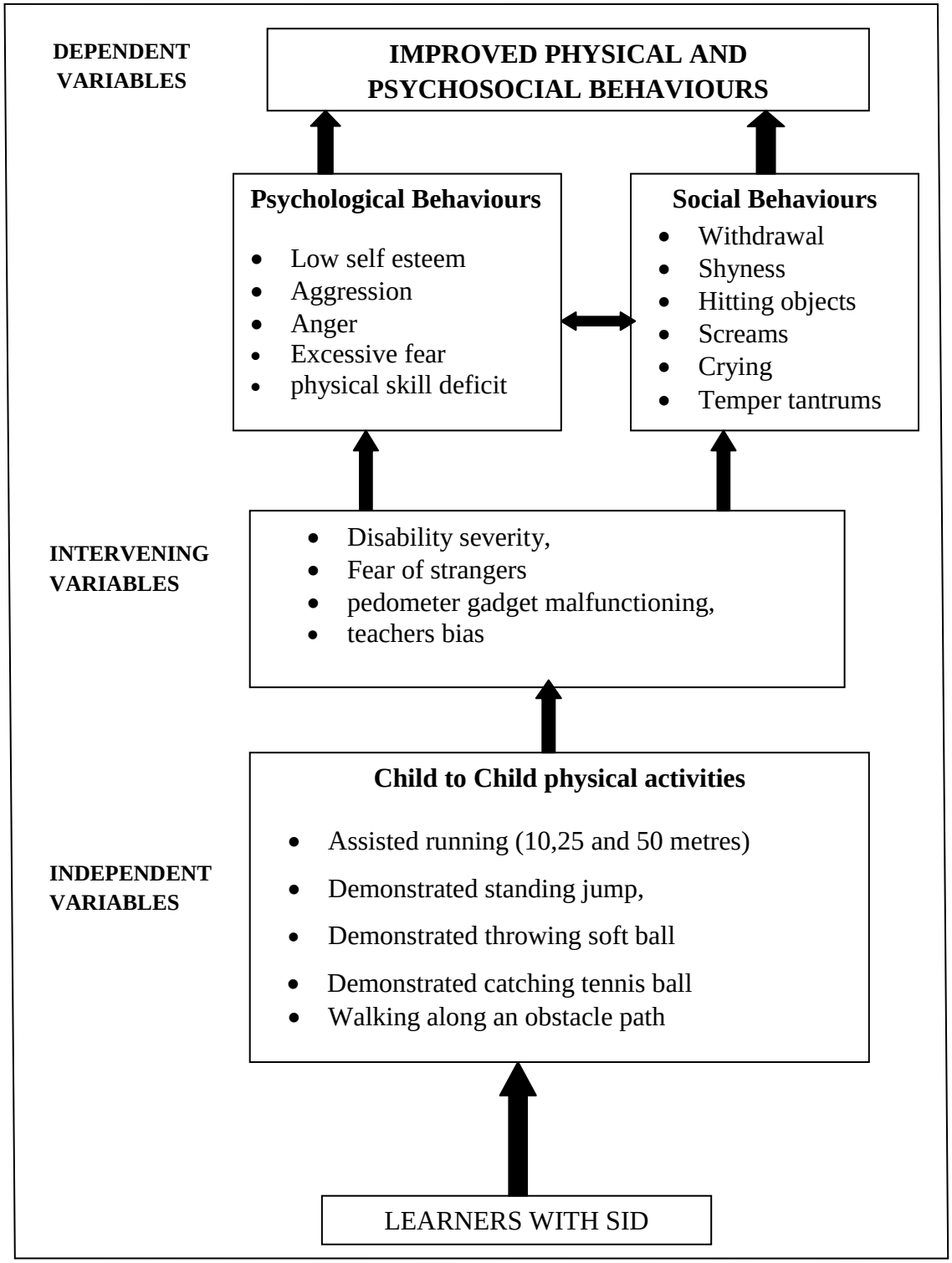


Figure 1.1: Conceptual framework

Source: Sourced from Bear, wolf and Risley (1968)

Figure 1.1 shows physical activity interventions among learners with severe intellectual disabilities in organized child to child programmes based on Baer et al. (1968) theory of Applied Behaviour Analysis (ABA). It is important to adapt and tailor the activities towards inclusive set-ups for both learners with and without intellectual disabilities (Mwangi, 2016). Further, Baer et al. (1968) emphasize applied behaviour analysis where the interaction of individuals will improve socially significant behaviours to a meaningful degree of change. Shennar-Golan and Walter (2018) emphasize that effectiveness is to increase physical activity levels by the use of evidence-based strategies. This means that researchers or practitioners have to test the strategy and show that it can increase physical activity as well as reducing the socially unacceptable behaviours. A review of the science in the same guideline shows that many evidence-based strategies can be used to promote and support physical activity. This calls for strategies that involve working with people one-on-one or in small groups to improve their physical activity levels. Other strategies can be implemented more broadly at the community level through programs, practices, and policies that make physical activity an easy recreation choice. These evidence-based strategies show that making physical activity a safe and easy recreation choice does help people become more active.

Child to child PA programme as an evidence-based strategy was geared towards improving physical and psychosocial behaviours among learners with severe intellectual disabilities. Learners with severe intellectual disabilities require the assistance of the able-bodied learners in physical activities in form of demonstrations and encouragements. Learners without intellectual disabilities may be offered an opportunity to voluntarily participate in physical activities organized

for learners with severe intellectual disabilities as a way of motivating them. According to Baer et al. (1968), the end result of applied intervention is its effects that are socially strong and can operate in new environments and continue after the end of the formal interventions. This means that both learners with and without intellectual disabilities would continue to play together in physical activities in both special and regular primary schools even after the organized child to child PA programme ends. This study, therefore, assessed child to child physical activity in management of psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya.

1.14 Operational Definition of Terms

Child to Child Programme: Child to Child is a concept**.** In this study, this means involving both learners with and without severe intellectual disabilities in an organized PA programme (Ringland, 2019).

Children without Intellectual Disability: In this study 'typically developing peers' is interchangeably used to mean 'child without' intellectual disability.

Primary schools: In this study, they represent both regular and special primary schools incorporated together. These were initially not together but were brought together during this study.

Intellectual Disability: A person who has limitations in adaptive behaviour and the disability must be present before the age of 18 (Gigi, 2014)

PE Teacher: A special education teacher who has hands-on training learners in physical education.

Physical activity: Is anybody movement using skeletal muscles that can lead to the use of energy (Bartlo & Klein, 2011).

Physical fitness: Physical fitness is the capacity to carry out daily living activities freely and pursue recreational activities as well as having the physical ability to endure emergencies (Bartlo & Klein, 2011). This means taking care of a person's body composition, flexibility, body endurance, neuron-muscle learning and strength. Skill related

components of fitness include agility, balance, coordination, reactions, power, and speed.

Psychosocial behaviours: These are both psychological and social behaviours of learners with severe intellectual disability that hinder their interaction and participation alongside their typically developing peers (Ritchie, 2016). This especially hinders them from being physically fit.

Regular primary schools: They are institutions catering for the typically developing learners. This means learners without disabilities (Kochung, 2003)

Severe intellectual disabilities: Learners termed as low ability group both intellectually and in physical activity performance (McConkey, Peng, Merritt & Shellard, 2019)).

Skill deficit: In this study, it means LWSID not able to perform physical skills at the beginning of the PA programme.

Social interaction: These are behaviours of relating together mutually where two or more people are involved (Bukhala, 2012).

Special primary schools: Are institutions which specifically deal with learners with intellectual disabilities (Kochung, 2003)

Therapist: A person who works directly with a person with a problem (Holecko, 2016). In this study, it means learners without disabilities participating together with learners with intellectual disabilities.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

In chapter one, this study aimed at assessing the effectiveness of the organised child -to-child physical activities in management of psychosocial behaviours among learners with severe intellectual disabilities. Literature was sourced and organized according to the objectives of the study. This entailed literature identification of psychosocial behaviours among learners with severe intellectual disabilities and their involvement in physical activity. Thereafter, a review of the effects of physical activity on psychosocial behaviours of learners with severe intellectual disabilities was discussed. Finally, the literature on the benefits and challenges of involving both learners with and without intellectual disabilities in PA was sourced.

2.2 Identification of Learners with Severe Intellectual Disabilities Exhibiting Psychosocial Behaviour

In this section, identification of learners with severe intellectual disabilities is discussed in line with their nature as well as their psychosocial behaviours.

2.2.1 Nature of Learners with Severe Intellectual Disability

According to the American Association on Intellectual disability, these individuals are characterized by low IQ of below 70 on a normal curve standardized scale and limitation in adaptive skills including communication, self-care, home living, social inter-personal skills as well as community resource usually occurring before the age of 18 (Nieuwenhuizen, Embregts, Smulders, Lucas and Nouwens, 2017). Olsman, Echteld, Goudoever, Willens and Nieuwenhuijse (2019) further say that Persons

with ID are characterized by neuro-motor dysfunctions, sensory impairments as well as medical problems. Psychology and researchers sub-divide individuals with intellectual disabilities into four groups in order of severity including Borderline, mild, moderate and severe. This is done through grouping by IQ according to Gigi, Werbelloff, Goldberg, Portuguese, Reichenberg, Fruchter and Weiser (2014) clinical definition in Table 2.1.

Table 2.1: Clinical definition of IQ disability measure (Gigi et al., 2014)

Level of disability Severity	**Intelligent Quotient (IQ)**
Borderline	70-75
Mild	55-70
Moderate	30-55
Severe	Under 30

Persons with intellectual disability face a great diversity of comorbid psychopathologies including autism spectrum disorders, attention deficit hyperactivity disorder and substance use disorders (Nieuwenhuizen et al., 2017). In that study, the age category reported having the highest frequency, was 11-20 years (39.2%) the age bracket within which was the current study concern. The study results also showed that all of the 11-20 years had significant intellectual limitations and adaptive behaviour problems (100%) and difficulty connection to peers (76%). It is only with an increased understanding of their limitations that these individuals can be supported to achieve better clinical judgement through the provision of individualized supports to accomplish their good health in the society (WHO, 2016). This would be through programmes that are physical activity-oriented as in the case of the current study of persons with severe intellectual disabilities. Compared to

their typically developing age-mates individuals with severe intellectual disabilities are immature in social interactions. This includes limitations in perceiving peers' social cues as such they have problems in regulating emotions and behaviours. They, therefore, need some support for physical activities to manage their psychosocial behaviours.

According to Vugteueen, Vander Putten and Vlaskamp (2014) approximately 0.06% of the total population have profound and severe intellectual disabilities. The researchers say persons with severe intellectual disabilities are characterized by co-morbid associations including, behavioural, mental illness (30-60%) seizures (10-40%), sensory impairments (7-20%), cerebral palsy (10-20%), sleep disorders (80%) recurrent emesis (15%), obesity (30-50%) Autism (10-30%). As a result of this, they are limited in self-help and daily living skills and typically require supervision and support to live independently hence a need for physical activeness. Kumar, Robison and Till (2015) stipulates that PA increases cerebral blood flow and circulates levels of norepinephrine and endorphins. These are chemicals in the neurones that positively affect mood, self-confidence and concentration while moderating anxiety, stress, anger as well as improving behaviour (Kumar et al., 2015. This supports the current study intent of child to child physical activity in managing psychosocial behaviours among learners with severe intellectual disabilities.

For persons with severe intellectual disabilities and their typically developing peers, it is generally acknowledged that being physically active regularly is important because of the positive effects on physical and mental health (Bartlo & Klein, 2011). However, persons with severe intellectual disabilities are less physically active compared to their typically developing peers. This inactivity may negatively

influence physical health problems like sleeping problems as well as challenging behaviour (Hylkema, Petitiaux, & Vlaskamp, 2011). In this concern Wounters, Heleen, Even, Thessa and Hilgenjamp (2018) examined the level of physical activity in older adults with intellectual disability by measuring executed steps each day, in which the standard for inactivity was set at around 10,000 steps and realized they were less active compared to the general population. However, the study did not explicitly indicate the level of disability severity as to whether mild, moderate or severe. However, a cross-sectional study was carried out by Annette, Van der Putten, Leontien, Bossink, Suzanne and Vlaskamp (2017) where data were collected within one group over one period of 4 weeks. The sample size of 58 persons with severe intellectual disability (42 males and 16 females) participated in that study (Men age = 34.6, SD = 13.6, range: 11–63 years). The participants were recruited from four different residential facilities – A (n = 27), B (n = 14), C (n = 8), and D (n = 9). Their estimated IQ was between 20 and 25. They exhibited severe motor disabilities characterized by the limited functional use of arms and legs. They were therefore totally dependent on significant others for support in all tasks. The research aimed to analyse the degree and type of motor activation in persons with severe intellectual disabilities. The results showed a low number of motor activities that facilitate the movement of the whole body or parts of the body. However, the study sample was said to be too small to include factors that could be associated with motor activation. The study recommended further research on this group which the current study also upheld. The above studies looked at older persons with SID where this inactivity was found to be extensive. Waninge, Putten, Stewart, Steenbergen and Schans (2013) also noted low motor activation in persons with

severe intellectual disabilities. The extent of children with severe intellectual activeness was not extensively established hence the intent of the current study.

People believe that persons with severe intellectual disabilities have motor disabilities and cannot move thus cannot profit from movement-oriented activities (Ogg-Groenendaal, Hermans, & Claessens, 2014). The study at hand wished to prove otherwise by involving children and adolescents with severe intellectual disabilities in physical activity to assess their behaviour change at the end of the child to child PA programme. This supports Bartlo and Klein (2011) review into the effects of physical activity programs (balance training, aerobic training, and resistance training) for adults with intellectual disability and found evidence of an increase in balance and muscle strength. A few other studies have found that children and adults with more severe levels of intellectual disability can also profit from movement-oriented interventions (Houwen, van der Putten, & Vlaskamp, 2014). Training in motor skills enables a person to experience, explore, and understand the world around them (Reimer & Siemonsma-Boom, 2013). In most studies, however, people with severe intellectual disabilities were excluded either in the recruitment phase, because of their assumed inability to be physically active or their associated impaired mobility, or in the data analysis, because of the low number of participants (Hilgenkamp et al., 2012). This dictates lack of fundamental knowledge about the development of motor functioning and the associated factors necessary to determine the best time to implement a motor intervention (Van der Putten, Houwen, & Vlaskamp, 2015). In their study, Van der Putten et al. (2015) indicated that knowledge regarding the course of motor development in children with severe intellectual disability and accompanying motor disabilities is rather

scarce. Even with few strategies and interventions related to motor activation in children with a severe intellectual disability the number of well designed, theory-driven, and evidence-based interventions purposely for children with a severe intellectual disability is minimal (Houwen et al., 2014). Beadle-Brown et al. (2014) say intervention for people with severe intellectual disability requires active support. This may be through adjusting the environment to meet the person's needs that can increase their capacity and reduce the effect of the disability (physical inactivity and psychosocial behaviours). This was the testing assumptions in the child to child PA programme organized in the current study in selected counties in Kenya.

2.2.2 Psychosocial Behaviours among Learners with Severe Intellectual Disabilities

Learners with severe intellectual disabilities have been found to exhibit a multitude of psychosocial behaviours. Such psychosocial behaviours include depression, physical skills deficits, feelings of shame, school problems, self-harm behaviours, regression, eating disorders, low self-esteem; aggressive behaviour, withdrawal behaviours, insomnia, anger, suicide attempts and relationship problems among others (Ritchie, 2010). Physical inactivity can also cause a myriad of emotional, psychological and behavioural problems that can cost one's life if not intervened. This study therefore intended to assess the effectiveness of organised physical activities programme as an intervention measure for psychosocial behaviours exhibited by learners with severe intellectual disabilities in selected counties in Kenya.

Most learners with intellectual disabilities feel emotionally unstable and psychologically affected when they go through challenges (Babedi, 2013). It is

therefore the mandate of educators to design programs that do not warrant much cost to manage all these psychosocial problems. In this reference, the current study intended to assess the effectiveness of organised child to child physical activities programme in managing the psychosocial behaviour among learners with severe intellectual disabilities.

Children lacking empathy are likely to experience aggressive behaviour and may not maintain healthy relationships with others (Babedi, 2013). This becomes a major problem for teachers trying to manage or modify the diverse emotions exhibited by learners with severe intellectual disabilities and especially where the family is not very supportive. For this reason, the current study intended to involve parents in observing their children's psychosocial behaviours before and after the child to child physical activity programme.

Adaamek et al. (2011) note five behaviours that were referred to as challenging among children with ID. They are aggression, self-injuries, being destructive, stereotypes and sleep disorders. The aggression behaviour ranged from 39.5%-87.5%. Sleep problems are more prevalent and severe among children with intellectual disabilities compared to typically developing children and thus training parents and teachers in behavioural approaches to managing sleep problems is advisable (Stuffard, Beresford, Clarke, Beecham & Curtis, 2015).

According to Knapp, Adams, Handley, Simkiss, Walls and Jones (2016) children with severe intellectual disabilities exhibit behaviours that have an external impact, such as aggression and destruction of the environment. The researchers pointed out that those challenging behaviours are frequently shown by children with severe

intellectual disabilities. Their study documented service use within this population exploring its relationship with challenging behaviours and child and parent characteristics. The result showed 49 mothers of young children with intellectual disabilities completed questionnaires focusing on child behaviour. The results were that maternal mental health was not associated with services accessed. There was no difference noted for self-injuries behaviour. The conclusion was that topography of challenging behaviour impacts the frequency and/or duration of community-based health care accessed (Knapp et al., 2016). More mechanisms are needed to be put in place to support children with disabilities attend different types of sports programs in the community (May, Sivaratnam, Katrina, Williams, McGillivray, Whitehouse, Rinehart, 2019). This, therefore, calls for more involvement in physical activities of these individuals to aid their challenging psychosocial behaviours management hence the intent of the current study. The more the service is made available the less challenging psychosocial behaviours exhibited and this leads to health well-being of children with severe intellectual disabilities. In this context, the current study focus was on assessment of the effectiveness of child to child physical activities programme in managing psychosocial behaviours of learners with severe intellectual disabilities.

Gast and Ledford (2014) study on a multiple probe across the behaviour of physical inactivity realized that at the end of the study there was increased physical activity level. The same increase was evident in Adams (2015) study which also established that the high rates of challenging behaviours at the beginning of the study had drastically reduced by the end of the study. However, the two studies only established the change in physical activity while the current study was to look at

change across many other psychosocial behaviours including withdrawal, screams, hyperactivity among others.

Maes, Bea and Ine (2009) in another study, children aged 0-19 years were coached for social interactions. The coaches reported attention deficit and hyperactivity disorders as the most common types of psychosocial behaviours. They recommended that having an inclusive setting and making adaptations to suit the child as well as giving extra time is very important for children with disabilities. Maes et al. (2009) results revealed four components important in interactions of these individuals including sensitive responsiveness, joint attention, co-regulation and an emotional component. The abilities and disabilities, interactive behaviours and personality of persons with severe intellectual disabilities influence these interactions. The more severe a disability is the more difficult it becomes to interact with the person. Maes et al. (2009) concludes that additional influences are the partners' interactive strategies, knowledge and perceptions and the context of the interaction. Based on that conclusion, such a model integrates the results and forms a vehicle to facilitate peoples understanding of interactions with persons with high support needs.

In another study, Pan, Chang, Tsai, Chu, Cheng and Sung (2017) explored how a 12-week stimulated developmental horse-riding program combined with fitness training influenced motor proficiency and physical fitness of children with a psychosocial behaviour of hyperactivity. Twelve children with hyperactivity were involved in the study intervention while 24 typically developing children were not. Their fitness levels and motor skills of the participants were assessed using standardized tests before and after the 12-week training program.

The findings of the above study indicated there were significant improvements in the motor proficiency, cardiovascular fitness and flexibility of those with hyperactivity. This means children with hyperactivity exhibited low levels of motor proficiency before the intervention (Pan et al., 2017). All the above studies elaborated much on the identification of psychosocial behaviours and their physical fitness among learners with intellectual disabilities. None related physical activity in management of psychosocial behaviours as an intervention strategy. The current study assessed the effectiveness of child to child physical activities in managing psychosocial behaviours exhibited by learners with severe intellectual disabilities as an intervention strategy.

2.3 The Extent of Involvement of Learners with Severe Intellectual Disabilities in Physical Activities

According to Tawanda and Majoko (2019), there are challenges like inadequate preparation and resources as far as the involvement of learners with severe intellectual disabilities in physical activities are concerned. The researcher emphasized on child to child relationships and noted that inclusion in PE would be an extension of daily living activities, roles responsibilities and social relations of learners with and without developmental challenges. The research paired and grouped learners who are short-tempered with those who are tolerant. The tolerant, however, would be allowed to withdraw from the study if they found it hard to tolerate such psychosocial behaviours (short-tempered).This was similar to the current study where learners without severe intellectual disabilities were allowed to exit the child to child PA programme freely.

According to Roult, Brunet, Ranger, Carbonneau and Fortier (2015) typically developing teachers were asked whether they would accompany youth with disabilities in organized physical activities. Out of 76 typically developing teachers, only 17% of physical education and sports teachers got involved followed by special education teachers (14%) while majority (68%) declined. This brings to the realization that involving physical education teachers in PA for learners with severe intellectual disabilities is very crucial. In special schools, physical education teachers are also special education teachers and therefore, they have the knowledge and authenticity of dealing with this group of individuals.

Furthermore, Holecko (2016) emphasizes that involving learners with ID in physical activities regularly helps to improve their health. Therefore, involving people with severe ID in physical activities is even more beneficial as it increases health-related outcomes as one of the intervention measures. Besides, Emerson and Baires (2017) highlight that adulthood males with intellectual disabilities are more likely to participate in sport exercise if they had frequently participated at age 14/15. This study, therefore, agrees with the current study's choice of age bracket 10-15 years.

In research, Giulio, Nirbhay, Mark, Jeff, Gloria, and Vivian (2018) used an ABAB design in riding a static bicycle and a stepper. Participants' responses with the exercise device (pedal) during baseline and intervention phases and their heart rates during the last intervention phase were observed. The results showed that all participants had significant increases in responding to exercise devices during the intervention phases. Their heart rates showed a moderate-intensity physical activity and an overall physical condition. A different device (pedometer) was chosen for the current study.

Another research by Dairo (2016) on physical activity levels among adults with intellectual disabilities reveals that only 9% of the participants achieved minimum PA guidelines. The study involved 15 studies consisting of 3,159 adults with ID aged 16-81 years comprising of 54% male and 46% female. Hong Kong China Census and Statistics Department (2015) also worked with 114 participants (71 males and 43 females). Among them, 36 had mild ID and78 had moderate ID with a mean age of 41. The two studies involved adults with mild and moderate intellectual disabilities. The study established that none of these studies measured PA levels of individuals with severe intellectual disabilities. The current study aimed at physical activeness behaviour changes of children with severe intellectual disabilities after the organised child to child physical activities programme in primary schools in selected Counties in Kenya.

Both persons with SID and their typically developing partners do understand each other mutually. They manifest their mutual understanding due to the structures that explain the interaction (Smith & Griffiths, 2016). This motivated the need for the current study. Odiango and Mse (2016) highlight that; learners with SID have low social functioning levels. The researchers recommend that programme administrators and special educators should design inclusive physical activities structures. Bukhala (2012) also adds that there is a need for universities, schools and hospitals to partner to provide the needed expertise to implement programmes for individuals with intellectual disabilities in the communities.

Bukhala (2012) in his study established that learners with ID participate in a low-level of physical activity but improved when encouraged by friends. The researcher also stipulates that learners with ID would benefit more from peers who are highly

qualified as motivators to physical activities. In this study, Bukhala (2012) involved university youths as motivators. The credibility of same age group partnering was questionable. This is because the study involved regular primary school learners who are mildly affected as opposed to those with severe ID and typically developed university students as motivators. This left out a gap of the same age and disability severity level that lend to current study choice. Therefore, this study aimed at assessing the effectiveness of organised child to child physical activities programme in managing the psychosocial behaviour among learners with severe intellectual disabilities in primary schools in selected counties in Kenya.

According to Mwangi (2016), learners with intellectual disabilities are still socially segregated. They are therefore not involved in societal matters including physical activity. This is evident when school-based games and sports are organized. The Ministry of Education in Kenya has scheduled games and sports sessions throughout the year (MoE, 2019) for both regular and special schools' programmes. However, there are no stipulated games for learners with severe intellectual disabilities and teachers are not aware of the physical activities they may initiate for these learners. The irony is further observed when considering the number chosen to take part in competitions. Only 8 (MoE, 2019) participants with severe intellectual disabilities per region which has more than 4 counties go for national games (10%). This is a smaller number compared to 72 (90%) that represents other categories with intellectual disabilities (mild and moderate) going to the same level. The current study aimed at involving learners with severe intellectual disabilities in organised child to child physical activity programmes to fill in this gap of less involvement.

2.4 Effects and Benefits of Child to Child Physical Activity to Learners with Severe ID

2.4.1 Physical Therapy

According to Holecko (2016) participating in physical activities regularly promotes competitiveness, coping abilities, independence, and teamwork among learners with disabilities. Page (2016) stipulates that physical activity not only enhances health outcomes in people with ID but also reduces challenging behaviours. This benefit is only observable after exposure to physical activity. Adams (2015) also realized that the high rates of challenging behaviours at the beginning of the study decreased drastically at the end of the study of the study after exposure to regular physical activities. Artekin Bayazrt and Colak (2014) further found that, adapted physical activity involving students with intellectual disability positively affected the level of emotional adjustment, self-managing and socialization behaviours among the students.

Bechar and Grosu (2016) support that physical activity influences social-emotional behaviours. Alison, Charmayne and Beverle (2014) unanimously also reported improvement in client challenging behaviour when staffs were trained on how to manage such behaviours. However, the research suggested that direct measurement of clients' behaviour is required to augment questionnaire results. Direct measures in the current study included the use of pedometers that were to help establish the number of steps each learner with and without ID made in the running of 25 meters and 50 metres dash.

The exercise therapy increases positive behaviour among learners. Persons, who do exercise every day, sleep better and this gives the body time to repair and restore.

Therefore, if learners make exercise a routine, they reduce stress and can concentrate on learning and training (Kelso, 2014). This implies that routine exercise may be very important especially to learners with severe intellectual disabilities who are physically inactive as well as exhibiting different types of psychosocial behaviours. The study at hand stipulated the day, the time and the process of doing the gross and sensory motor physical activities in an organized child to child physical activities programme which denoted a routine set up.

Page (2016) indicates that the intensity of the physical activity reduces challenging behaviours. Research has also shown that physical activities reduce anxiety among adult employees with intellectual disabilities (Cyrille, Bouret & Aurelie, 2015). Such anxiety results in psychosocial behaviours of aggression and anger. The current study used different physical activities both in sensory and gross motor skills as an intervention in the management of such behaviours. This gave LWSID a chance to at least get involved in one or more activities depending on the child's capability and severity of the disability. It also confirmed that interventions based on theories of behaviour change are successful in helping people achieve an active lifestyle.

Van Fleet, Sywulak and Snisck (2010) note that physical therapy just like child play therapy follows thematic progressive stages. These stages include warm-up, aggressive, regressive and mastery stages. For learners with severe intellectual disabilities, the exercise can be tailored in a way that the warm-up phase is extended for a while. This would test the extent and create rapport with the therapist. Learners without disabilities therefore took long during pre-test to motivate and create a good rapport with learners who have severe intellectual disabilities. During the aggressive

phase, individuals can manage feelings of any loss of control, emotions and fear among others. In the regression phase, the child gets an opportunity to nurture and feel nurtured. In child to child physical activities, these themes emerge as attachment, acceptance, love and nurturance; hence, improved psychosocial behaviour. By the end of regressive themes, the child gains confidence and mastery of physical activity skills. This aspect lacks in primary schools of both learners with and without intellectual disabilities. Society views these learners as sick. Therefore, most of them are not allowed to do physical activities by their teachers and parents or guardians. The researcher sought to create awareness gap of physical activity therapy through initiating child to child physical activity programmes for learners with and without severe intellectual disabilities in both special and regular primary schools.

2.4.2 Health/Physical Fitness

Awan and Chauben (2017) stipulated that people with intellectual disability have significantly worse health than those without and as such they experience a higher level of complex health needs. The researchers recommended increasing the general role of practice in delivering and coordinating care across health and social care settings. They emphasized implementing such service delivery in an integrated approach. Sprake and Walker (2015) highlighted that physical activity improves the child holistically focusing on the promotion of physical literacy. The current study assessed the effectiveness of organised child to child physical activities programme in managing psychosocial behaviours among learners with severe intellectual disabilities as regards physical literacy cited in the above studies.

In 2015, about 20% of high school students and adults were reported by the consensus physical activity guidelines for Asian Indians (Misra et al., 2012) as getting enough physical activity to meet the aerobic and muscle-strengthening key guidelines. Tsuboi, Hayakawa, Kanda and Fukushima (2011) affirm that physical activities improved aerobic capacity, mobility, gross motor functioning and high level of participation. The extent of learners with severe intellectual disability was not established. Mccoy and Morgan (2019) compared weekly physical activity, sedentary behaviour and body mass index among adolescents with and without autism spectrum disorders (ASD). Adolescents with ASD were found to engage in less physical activity and were more likely to be overweight and obese compared to their typically developing peers. Parents of the adolescent with ASD reported that as the disorder severity increased, the adjusted odds of being overweight and obese significantly increased and physical activity participation decreased (Morgan, 2019). These finds suggested a need for targeted programs to decrease unhealthy weight status and support physical activity opportunities for these individuals. In the current study learners with severe intellectual disabilities exhibited multiple psychosocial behaviours that included autistic characteristics (withdrawal and self-injuries). The current study assessed child to child physical activity programme's effectiveness in managing psychosocial behaviours including withdrawal and self-injuries.

Holecko (2016) warns that children with functional limitations on physical activity are either overweight or obese. Obesity in childhood has become a threat in many nations and this indicates the need for an urgent serious intervention. A study by Boer, Meus, Terblanche, Rombant, Wandele, Hermans, Gysel, Ruinge and Calder (2014) on sprint interval training on metabolic and physical fitness among

adolescents and young adults with intellectual disabilities noted that exercise demonstrates a reduction in fat percentage. The study involved 54 persons with intellectual disability and observed benefits in body weight, physical and metabolic fitness which was compared to a control group. This study however was based on child to child physical activity programme in managing psychosocial behaviours of 10-15 years old learners with severe intellectual disabilities. A benefit of psychosocial behaviours was left out in that study which was the current study's intention. The issue of a control group was not considered in the current study since this was a single subject of N-I where a subject stood out to be their own control. This also challenged unethical issues of not including all learners in health benefits since physical inactivity is unhealthy and all children needs intervention just like any other health problem.

Becham, Disney, Keebler, Debeliso and Adam (2019**)** using a Seated Medicine Ball throw studied physical skills acquisition termed as low-risk, easy to perform, requiring minimal equipment to validate measure of upper-body explosiveness. They did 3 consecutive trials within 0.25m- 3.85m/s before and 1.114m/s -3.92 m/s after and an improvement was observed. The interventions involve applying knowledge that teaches people skills that help them incorporate physical activity into their daily routines (Piercy et al., 2018). The above studies however were not done in Kenya. The current study sought to establish a Kenyan situation in a three months child to child physical activities programme involving learners with severe intellectual disabilities exhibiting diverse psychosocial behaviours.

In America, obesity leads to many lifestyle diseases that affect children (Kelso, 2014). Most learners with Down syndrome who also have a severe intellectual

disability have obese conditions. This limits their physical and psychosocial wellbeing. They require regular exercising which can build muscles, strengthen their stamina and make their immune system strong (Kelso, 2014). According to McConkey, Peng, Merritt and Shellard (2019) people with an intellectual disability are less physically active, live more sedentary lives, have lower fitness levels and are more likely to be overweight or obese than their typically developing peers. The SOI organization did research and reported no evidence on the impact of participation on physical activity and physical fitness levels (Bukhala et al., 2017). Adults with ID (16-64 years) were involved in physical activities in community-based clubs. Physical measures were waist circumference, height, weight, blood pressure, heart rate and 6 minutes walking test. A self-report questionnaire gathered data from respondents on physical activity levels. Further, Actigraph GT3x accelerometers were used to gain an objective measure of physical activity. The researchers realized that those that did moderate to vigorous physical activity per day had higher fitness levels and more positive health profile scores than those that did not take part in the physical activities programme. Gast and Ledford (2014) study on a multiple probe across physical inactivity behaviour established increased physical activity level at the end of their PA programme. Many of the above studies only established change in physical inactivity behaviour but the current study was to incorporate several other psychosocial behaviours. Further, the study had to do gross motor activities of running 25 and 50 metres routinely for a longer duration of 60 minutes per day, unlike the above 6 minutes walking test.

2.4.3 Improving Social Interaction Skills

Physical activities help a person to remain active and focused. Learners with severe intellectual disabilities have poor motor development; hence, their bodies are not active. As a result, Carrono and Gobbi (2012) say that individuals with ID generally have low self-esteem which can have negative consequences on their psychological balance, motivation, commitment to social exchanges and relationships as well as their ability to regulate their emotions. The psychological and social benefits of physical activities are equally important in improving a child's health. Bechar and Grosu (2016) highlight that physical activities influence social or emotional areas of functioning as well as cognition. They stipulate that work in the motor field serves both as a therapeutic and rehabilitative tool for each functioning domain. In the current study, the two domains included both gross and sensory motor activities. These activities serve as psychotherapy for learners with severe intellectual disabilities. Therefore, the positive effects of physical activities which promote general feelings of good health and wellness of learners should be emphasized (Bukhala, 2012). Pre-post-test experimental model research done on 12 students from 5^{th} and 6^{th} grade in a public school in Esenyant district of Istanbul in 2015-2016 academic years by Guvendi and Ilhan (2017) proves this. This is when the adapted physical activity program was applied to the students for 2 days I hour per week for 12 weeks and the results showed a decline in students pre-post-test mean scores of self-managing and socialization of the children. Students socialization scores increased and emotional adjustment problems decreased among typically developing students. However, this aspect of self-managing is lacking among learners with severe intellectual disabilities who are generally perceived as valueless to society. They are therefore entirely dependent on families and significant others

for their survival. This study assessed the effectiveness of the typically developing learners' motivation gap in the managing of psychosocial behaviours among learners with severe intellectual disabilities.

Rossetti and Keenan (2017) Say that despite emphasis from families and educators of students with severe disabilities on the importance of promoting and supporting friendships with their typically developing peers in inclusive settings, such relationships remain infrequent. However, Roult, Brunet, Belley-Ranger, Carbonneau, and Fortier (2015) say practising a sport is an integral part of the educational process designed for learners with disabilities and this should be done with youth with disabilities when at school since they tend to be active during school days. Practitioners ought to offer physical activities and sports to these individuals although means seem to be limited. Regardless of the type of school, physical activities available to young people with disabilities should either be done individually or in teams of two. This study adopted the later by pairing learners with and without severe intellectual disabilities in the organized child to child PA programme.

2.4.4 Life Lessons

It is through participating in various sports that a learner gets to learn many things about life including co-operating with others (Kelso, 2014). This is especially important to learners with severe intellectual disabilities who are not exposed to their peers in the community. Reduced physical activity level limits the motor skills developments which are found to decline from childhood through to the adolescent years (Kelso, 2014). Therefore, physical activity is one of the major lifestyle-related health determinants (Misra et al., 2012). This then calls for interventions that will

have greater impacts on life variables such as social and motor skills (Sowa & Meulen, 2012).

The American Guidelines for physical activity (Piercy et al., 2018) recommends early start provision where children should be encouraged to do a lot of safe and unstructured movement and play at home and in the neighbourhood. This would help build a strong healthy habit foundation throughout their lives. In this study, the neighbourhood included was special and regular primary schools. School-aged children need time for active play during breaks, physical education classes and during the team and individual sports. They also need after-school programs and active time with family and friends (Piercy et al., 2018). In the current study, PE lessons in the school time table were utilized to aid the child to child PA programme to avoid interfering with the learners' free time. This allows for free choice activities among learners with and without severe intellectual disabilities necessary for self-directed physical skills.

Parents, caregivers and teachers should model and encourage an active lifestyle for children through praise, rewards and encouragement to help them be active. Family members' activeness is a great way to model and encourage physical activeness in children. Parents in the current study would give consent for their children involvement in the research PA programme. Physical Education teachers and the research assistants were to monitor and give instructions in the gross and sensory motor physical activities. Learners with severe intellectual disabilities were encouraged and motivated by those without severe intellectual disabilities to perform physical activities.

Wehmeyer, Shogren, Zagar, Smith and Simpson (2010) note that self-determination emerges across the life span as children and adolescents learn skills and develop attitudes that enable them to be causal agents in their lives. However, to those with severe intellectual disabilities, the self-directive activities show a great limitation. Only a few gain self-directed physical activities a reason to engage in supportive activities all the times. This study assessed the effectiveness of varied organised child to child physical activities in managing the psychosocial behaviour among learners with severe intellectual disabilities aged 10-15 years. Self-directive gain was a realized gap in the current study as was reported by PE teachers of learners with severe intellectual disabilities.

2.5 Child to Child Participation in Gross and Sensory Motor Activities

The American Guidelines for Physical Activity (Piercy et al., 2018) recommend that children and adolescents should meet the key guidelines by doing an activity that is appropriate for their age. The guidelines state that children's natural patterns of movement differ from those of adults. Children are naturally active in an intermittent way and especially when doing an unstructured active play. During recess and in their free play and games, children use basic aerobic and bone-strengthening activities such as running, hopping, skipping and jumping to develop movement patterns and skills. They alternate brief periods of moderate- or vigorous-intensity activity with periods of light-intensity physical activity or rest (Piercy et al., 2018). Any episode of moderate- or vigorous-intensity physical activity, however brief, counts toward the key guidelines for children and adolescents aged 6 through to 17 years. This influenced the researchers' choice of the age group (10-15 years).

Sato and Hegel (2017) support that students with disabilities are more likely than ever to be educated in physical education classes with their typically developing peers and thus all educationist including physical educators need to have proper teacher education to help meet the unique needs of these students. Graduate students reported having experienced difficulties during the practical hands-on with the severe and profound disabilities. They exploited the adapted physical education skills for 200 hours with these learners. Unpredictable behaviours were also noted and catered for. Learners' age was 2-21 years. They had an individualized education programme for each learner with severe and profound intellectual disabilities. The instruction was one-on-one for 30-45 minutes per class. Learners with severe and profound intellectual disabilities would participate in the APE classes at least once a week. The result was that graduate students and special educators realized that students with severe and profound intellectual disabilities should be taught motor and social skills rather than functional skills during PE classes (Sato & Hegel, 2017). The study at hand catered for this gap through assessing gross and sensory motor activities as well as social interaction in a child to child physical activities programme.

According to the American guide on physical activity(Piercy et al., 2018) an instructor need to train children with appropriate physical activities according to their age, regulate the intensity of activities, increase physical activity gradually over time, set goals, use protective gear and proper equipment. The instructor also needs to follow rules and avoid injuries. In this study, the activities with less intensity were introduced first then gradually the level of intensity was increased. Besides, proper PE gears were used (sports shorts and shoes). Children and adolescents should be

exposed to a variety of activities, including active recreation, team and individual sports. Activities should include what the individual can do well and enjoy. Such activities include jogging, bicycling, hiking, swimming, exercise classes and strength training. However, children should experience non-competitive activities that do not require above-average athletic skills. This gap was catered for by the current study where these physical activities were organized in the child to child physical activity programme without competition. Children with severe intellectual disabilities were motivated and encouraged to do the simple gross and sensory motor activities like running (25 and 50 metres dash), walking (10 metres assisted walk), throwing and catching the bows (Softball and Tennis ball) by their typically developing peers instead.

According to the American Physical Activity Guidelines (Piercy et al., 2018), it is important to provide young people with opportunities and encouragement to participate in a variety of enjoyable physical activities that are appropriate for their age. The guideline emphasizes that children and adolescents aged 6– 17 years should do 60 minutes (1hour) or more of moderate-to-vigorous physical activity daily. The same recommendation is done by the Asian Indian Consensus Physical Activity Guidelines (Misra et al., 2012) with an earlier age of 5-17 years. This means that most of the 60 minutes or more per day should be either moderate- or vigorous-intensity aerobic physical activity. Alternatively, it should also include vigorous-intensity physical activity for at least 3 days a week. However, the current study employed two days in a week at 60 minutes per day in the running of 25 and 50 metres dash as well as standing long jump. This was due to the schools tight schedules that could not allow much time for the child to child PA programme.

As part of their 60 minutes or more of daily physical activity, children and adolescents should include muscle-strengthening physical activity at least 3 days a week. The current study did not use lifting physical activities for muscle strengthening due to the nature of learners with severe intellectual disabilities inability to perform such activities (Misra et al., 2012). More of daily physical activity, children and adolescents should include bone-strengthening physical activity at least 3 days a week. In the current study, the sensory and gross motor activities was to do this through throwing and catching of soft and tennis ball respectively. A report on standing long jump physical activity was given in Italy by Guidetti, Franciosi, Gallota and Baldari (2010) where 3% of those involved in the study were those with severe ID. The study tested the standing long jump with 38% mild disabilities, 22% moderate, 38% difficult and 3% extreme (severe). In terms of age, their study dealt with a wide range of age group (18-45 years) of intellectual disabilities. The current study not only involved the standing long jump but other gross motor physical activities (running of 25 and 50 metres dash) were incorporated to assess learners with severe intellectual disabilities physical activeness improvement.

A study by Guidetti et al. (2010) also showed that learners with severe intellectual disabilities had a low level of physical activeness compared to those without intellectual disabilities. The research used 29 participants categorized as 9 mild intellectual disabilities, 8 with moderate intellectual disability, 9 with high intellectual disability and 3 extremes (severe) intellectual disabilities between chronological ages 20-45. These findings indicate less involvement of those with

severe intellectual disabilities in many studies as pointed out by Handicap International Report (2017).

In all of the above studies, learners with severe intellectual disabilities were involved less the reason this study targeted only this category to fill the gap that has been left out in physical activities. Furthermore, even when they were involved a very minimal number was included alongside other levels of the same disability let alone those without disabilities. To stand in for this gap the researcher majored in learners with severe intellectual disability as the key determinant in the current study.

In a study by Ming Yang-Chul-Hyeong Park, Yoonsuk and Jek (2018), participants took an average of 6,677+2,600 steps per day, with an intensity of 1,040+431 counts per minute. Low motor development was associated with low physical activity. According to this research, more than half of the participants were not meeting the recommendations of their physical activeness measure. By use of a step counts GT3X Actigraph/WGTX a report on physical activity and physical fitness of adults with intellectual disabilities highlighted that 67% of them showed a sedentary behaviour. This was established by the use of an objective physical activity measure (WGT3X-BT) and only 9% of adults with ID activity measure met the PA guidelines. These devices translate movement in the direction of three internal axes into counts and have to be worn continuously on several days' consecutive during walking hours except during water-based activities like bathing and swimming. These are validated devices to use on children with intellectual disability and more so those that are moderate and mild (McGarty, Penpraze and Melville (2016). A case of using these devices on learners with severe intellectual disabilities was not

established. This led to the choice of a bit simpler device (pedometer) gap to use on these learners that does not warrant much technicality in operation.

Beekman, Tak, Tenbacl, Deenik and Kruisdijk (2017) say that accelerometer for measuring sedentary behaviours and physical activity of persons with severe mental conditions are limited and are urgently needed to reveal prevalence and magnitude of their physical fitness. Shennar-Golan, & Walter, (2018) further suggest that BMI is also important for undertaking PA fitness in adolescents and should be considered when preparing programs aimed at improving physical activeness. The current study sought to use pedometers to establish participants with severe intellectual disabilities change in their physical activity skill deficit of gross-motor functioning. The device was easier to use considering the severity of the disability category of learners with severe intellectual disabilities. On the other hand, the cost effectiveness of this device was affordable to the researcher and easier to operate. The guidelines PA data from both objective and subjective measures also established 30%-47% of the typically developed individuals have a sedentary behaviour (Ming Yang-Chul-Hyeong et al., 2018). This show there was a significant difference in the PA levels of adults with and without ID. This study established a case of children with severe intellectual disabilities and their typically developing peers a unique group that has been left out in physical activities.

A PA measure study was done among 30 adults in Hongkong by Chan and Chow (2015) with mild to moderate adults with ID for 14 consecutive days. The results indicated low levels of step counts among adults with ID. (7650+2347) steps per day were counted low compared to the recommended Hongkong guidelines (8000 steps per day). Data from the accelerometer were captured in 60-minutes periods and non-

wear time was defined as > or= 60 consecutive minutes of zero recordings. Sedentary time was defined as <100 counts min. A similar 25 and 50 metres dash was done using pedometers at 60 min combined with regular verbal encouragement prompts and a reliable linear coefficient relationship of R^2= 1 was considered high enough to accept or reject an assumption. The assumption was that there was no significant relationship between regular PA activity and learners with severe intellectual disabilities' physical activity levels.

Wounters, Heleen, Even, Thessa and Hilgenjamp (2018) establish that physical activity behaviour correlates with accelerometers. These indicate that children and adolescents with intellectual disability are less active than typically developing children (Einarsson, Johannsson, Daly & Argrimsson, 2016). Leung, Siebert and Yun (2017) conclude that little is known on the habitual (regular) physical activity levels of children and adolescents with more severe levels of intellectual disability. Mcmahon et al. (2017) stipulate that activity level decrease with age in adolescence and that more research need be done to understand the reason for this decline. The researchers also added that little is known among those with disabilities including those with severe intellectual disabilities. Most of the above studies were conducted among children and adolescents with mild to moderate intellectual disability leaving out those with severe intellectual disabilities as Leung et al. (2017) stipulates.

Westendorp, Hartman, Houwen, Smith and Visscher (2011) results on the correlation between motor abilities and participation in organized sports activities among learners with mild intellectual disabilities (N=156, 104M, 52F) between the ages 7 and 12 and children with normal development (N=255, 138M, 117F) in the same age bracket had similar physical activity skills with the current study. The

physical activities in the current study included running, jumping, catching and throwing while Westendrop et al. (2011) study included leaping, sliding, kicking and bouncing which the current study left out because of study learners' disability severity. The skill level was measured twice in that study while in this current study it was measured thrice (pre-test, mid-test and post-test) to cater for internal validity. In Westendrop et al. (2011) Children with intellectual disabilities scored significantly lower than their typically developing peers. The ones with high scores were reported to have more organized sports activities. It was also observed that participation in sports activities improved the motor skills of learners with intellectual disabilities. Object control skills such as throwing and catching improved significantly. Children with mild intellectual disability that regularly took part in more organized sports activities proved to have high scores. However, they had lower scores in loco-motor measures such as running and jumping. The age bracket in the current study focus was on learners aged 10-15 years that agreed with Westendrop et al. (2011) learners' age of 7 through 12 years favouring school-going children unlike Guidetti et al (2010) who concentrated on those aged 18-45 years favouring adults with intellectual disability out of school.

The American Guidelines Report for Physical Activity (Piercy et al., 2018), emphasizes that participation in physical activity in a community setting with others, such as friends and family, can increase physical activity levels. The report also establishes that adults are more likely to participate in physical activity when they were supported by others at specified levels of physical activity. This means that providing adult individuals with friendship and support for physical activity enhances their participation. This report does not focus on children and adolescent

learners with severe intellectual disabilities a gap that this study filled. Persons with intellectual disabilities are often characterized by having more difficulties and limitations in the performance of sports skills (Bechar & Grosu, 2016). Most researchers recommend the need to establish mechanisms that support children with disabilities to participate in PA programs in the community (May, Sivaratnam, Katrina, Williams, McGillivray, Whitehouse & Rinehart, 2019). This should include those with severe intellectual disabilities who are normally left out in any physical activity programmes in community setups. In this context, the current study sought to add on to the knowledge gap of involving learners with severe intellectual disabilities in physical activities in integrative school setups.

2.6 Teachers' Challenges in Involvement of both Learners with and without Intellectual Disabilities in PA

Keller (2014) note that persons with intellectual disabilities are marginalized and discriminated against. This leads to many challenges which hinder their full inclusion. Holecko (2016) adds that scarcity of sports and recreational programs for children with disabilities only denies them inclusion opportunities. Block, Talicferro and Moran (2013) also say that there is a lack of consistent transportation and knowledge among the PE teachers and parents. Negative societal attitudes towards disability and natural barriers of multiple disabilities exclude rather than integrating children with intellectual disabilities. A study by Hammond, Young and Konjarski (2014) on coaches' perceptions in Australia revealed that they perceived athletes with intellectual disability as having difficulty following directions, remembering strategies and staying on a task which posed a problem including them in regular sports. They found out that a few groups were more likely (P=<0.001) to have more

favourable beliefs towards perceived confidence of including persons with ID in the regular programs. Therefore, this problem continues to be magnified.

Ginewa, Courtade, Test and Cook (2015) argue that learners with severe intellectual disability present significant challenges to special educators and other stakeholders in terms of selecting and implementing effective instructional practices. The researcher in the current study established challenges that were faced by the PE teachers while involving learners with and without intellectual disabilities in an organized child to child physical activities programme in primary schools in selected counties in Kenya.

Temple and Stanish (2011) studied participation in community-based physical activity for youth with intellectual disabilities. They used a target population of 40 and a sample of 34 participants in a PA programme. The researchers found that most of the barriers hindering LWID participation in PA were personal. However, parents reported that their typically developing children benefited from that study since they acquired new skills, interacted with other adolescents and became more independent which was not the case with LWID. A case of Kenya was yet to be established hence the intention of the current study.

In another study by Bedell, Coster, Law and Liljenguist (2013), children and youth with disabilities were reported as having taken part less in organized physical activities in the community (10 %) while their typically developing peers highly took part (37%). In the same study, parents (36%) reported that there was no access to PA programmes and services as compared to 3% of children without disabilities.

Further, it was reported that athletes with intellectual disabilities are underrepresented in PA (Handicap International, 2016).

Sowa and Meulenbrook (2012) notice 40% acquisition in motor skills performance irrespective of gender. Graham, Baer, Frind, Barr-Anderson, and Nuemark-Sztainer (2014) also, had a clear performance difference in strenuous PA by sex n=126f, n=107m for children and adolescent aged 13 to 18 years and T was (223) =2.1, p 0.01 while average strenuous PA was greater for boys (m=3.9 SD=2.4) than for girls (M=1.8, SD=2.4). This proved a challenge on one gender involvement in physical activities more than the other. Unlike that study, the current one involved both male and female in the organized child to child PA programme.

WHO (2018) raises the alarm over children spending more time in institutions which do not provide opportunities for physical activities. This has contributed to less physical activity for them while growing up. Boarding institutions including special schools for learners with intellectual disabilities have increased the sedentary behaviours among children and adolescents. Learners with severe intellectual disabilities are termed as incapacitated and/ or are sick by the caregivers including the teachers. Therefore, they are not involved in physical education sessions. It is in this context that European countries are reporting less commuting to and from school (WHO, 2017). According to WHO (2017), physical activity is a necessity, not a choice and having the opportunity to enjoy quality recreation is vital to the health as well as personal development of all individuals, regardless of gender or functional ability.

People with profound/severe intellectual and multiple disabilities (PIMD) have relatively higher incidents of life-threatening medical conditions e.g. respiratory disorders. Where the needs of persons with intellectual disability have been considered, the focus is on those with mild intellectual disability, leaving people with PIMD at most risk of not being involved (Voss, Vogel, Wagemans, Francke, Metsemakers, Courtens and Veer (2019). However, Kirkendall, Linton and Farris (2017) highlight that people with SID's preference in societal activities was less than that of those with mild and moderate intellectual disabilities. This is because the mild and the moderate can do some functional skills and as such, they are integrated with some vocational activities in the society that those with severe intellectual disabilities are limited in. As a matter of fact no child should be left behind in any societal activity due to disability limitation but rather adaptation and modifications of the environment should be established. Regarding this gap the current study adapted the current competent based (CBC) sensory motor learning area to fit learners with severe intellectual disabilities recreational physical activities.

Tonkin, Ogilview, Green Wood, Law and Anaby (2014) reviewed perceptions and influences of participation of children and youth with disabilities in activities outside a school in Canada. The study reviewed studies from 1990 to 2012 and included participants aged between 2 to 18 years with at least one physical or intellectual disability. It was established that 37% of the children and youth with disabilities never took part in organized physical activities in the community as compared to only 10% among their typically developing peers who had not taken part. The studies assessed more than one disability type. The current study sought to establish

the levels of participation in PA among learners with severe intellectual disabilities only in a child to child physical activity programme in selected counties in Kenya.

Aimable and Etienne (2016) conducted a study in Uganda and revealed that people with a disability do not participate due to lack of adapted sports equipment, lack of experts, lack of means to participate in international competitions as well as lack of finances. While the school environment should provide more play opportunities, most of the learners with ID are segregated and denied such chances (Mwangi, 2016). Most of these studies only examined patterns and determinants of participation of children and youth across all categories of disability in physical activities. None of these studies looked at the levels of severity among LWID. This led to the current study's choice of learners with severe intellectual disabilities.

2.7 Summary of Literature Review

From the review of the literature and related studies conducted in the area of physical activities and intellectual disabilities, it was clear that there were gaps that needed to be filled. These included identification of learners with severe intellectual disabilities, the extent to learners with severe intellectual disabilities were involved in physical activity, physical activity improving psychosocial behaviours of learners with severe intellectual disabilities, physical activity levels of learners with severe intellectual disabilities, performance of the gross and sensory motor activities by learners with severe intellectual disabilities and finally, benefits and challenges of involving learners with severe intellectual disabilities in physical activities.

Identification of learners with severe intellectual disabilities psychosocial behaviours have been minimally done (Knapp et al., 2019).This study has

extensively identified numerous psychosocial behaviours among learners with severe intellectual disability. This included physical skill deficit which is a major global concern for the improvement of health living to everyone. Studies done in Taiwan and America sought about moderate and mild adolescent learners with intellectual disabilities involvement in physical activeness (Chan & Chow 2015, Voss et al., 2019). This differs from the current study in that; the current looked at involvement of learners with severe intellectual disabilities. While Physical activity levels of adults with SID is known, less is known about physical activity levels among children with severe intellectual disabilities a gap that this study filled (Einerson et al., 2017 & Leung et al., 2017). Many studies dwelt much on gross (loco-motor) motor activities leaving out the aspect of sensory motor activities (Westendrop et al., 2011, Bukhala, 2012 & Mwangi, 2006). The current study included the sensory motor physical activities necessary for sensory integration skills learning.

Other studies established fat adiposity and physical fitness behaviours benefits among learners with mild intellectual disabilities (Dairo, 2016) & Wachira, 2014). No studies looked at management of psychosocial behaviours among learners with severe intellectual disabilities through child to child physical activities. This study established this gap. Further, learners with severe disability were said to pose challenges to teachers and significant others (Hammond et al., 2104 & Ginewa et al., 2015). However, the current study findings realized enhancement of instruction responses and psychosocial behaviour change after child to child physical activity participation. Therefore, this study assessed the effectiveness of organised child to

child physical activities in managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the methods that were employed in the achievement of the research objectives on the effectiveness of child to child physical activity in managing physical and psychosocial behaviours among learners with severe intellectual disabilities. Similarly, the previous chapter strengthened the study objectives through the relevant literature. The current chapter covers research design, location of the study, target population, sampling techniques and sample size. The chapter also has research instruments, pilot study, data collection techniques, logistical and ethical considerations as well as data analysis.

3.2 Research Design

The study employed a single- subject quasi-experimental research design. Single-subject involves behaviour analysis and it is referred to as within-subjects research. It entails observing a single individual over a baseline period, administering an intervention which is then followed by another observation at the end of the intervention. The aim is to establish whether the intervention would bring about an effect. The subject becomes its own control in the experiment (Ary, Jacobs, Sorensen & Walker, 2014). According to Cook and Campbell (1979), though the independent variable is manipulated in quasi-experimental designs, participants are not randomly assigned to conditions or orders of conditions. This design is used where group designs are not appropriate, particularly when the instruments are not pertinent and observations must be the method of data collection. Systematic and direct observation of behaviour here is a hallmark of single-case research, which is

the predominant methodology used to investigate the effects of interventions for individuals with complex support needs (Yolder, Lioyd & Symons, 2018). In this case, a learner with severe intellectual disabilities experience complex support needs as far as managing the numerous psychosocial behaviours is concerned. A single-subject research design is used to establish behaviour changes in an individual exhibited after being exposed to an intervention or treatment of some sort (Fraenkel & Wallen, 2010). Another important point to note is the uncontrolled baselines where the behaviour could be observed without setting any systematic intervention in place. Once an uncontrolled baseline is established and intervention is implemented then improvements in behaviours is noted (Kennedy, 2005). The conception of uncontrolled baselines is that behaviours are occurring at zero or near-zero levels hence the current studies reason of measuring behaviour at mid-test for the first time. This happened in the current study where psychosocial behaviours among learners with severe intellectual disabilities were observed immediately without setting baselines and behaviour change and was only measured at mid-test and post-test.

Morano, Ruiz and Hwang (2017) noted that in single case-designs, conditions are manipulated across time. Further, manipulations are replicated in efforts to induce reliable patterns of behaviour change. The researchers emphasized the use of support among individuals with injuries behaviours involving different reinforcements. In line with this, learners with severe intellectual disabilities were motivated by their typically developing peers. According to Neuman, McCormic and Sandra (1995), single-subject experimental designs basic procedures include; collecting baseline data that is collected before an intervention. Variables are then manipulated and data

gathered frequently overtime throughout the intervention and sometimes after the intervention. In this study physical activities were manipulated as the interventions. In single-subject the procedures are controlled rather than group controls. Procedures in the performance of physical activities were employed in the current study. Standard measurement or observational recordings approaches are employed to examine permanent products. This was evident when pedometer step count was used to measure the physical activity level of learners with severe intellectual disabilities. There is also inter-observer agreement for both dependent and the independent variables assessment. The trend of the physical activities practice and the psychosocial behaviour change were compared to assess the effect of the intervention. In single-subject, all data are graphed. Specific guidelines are used visually rather than a statistical. Analysis is undertaken for each subject's graphed data as in the case of gross and sensory motor physical activities in the current study. However, in other cases visual and statistical analysis are used same as the current study. Maintenance and transferring data are compiled and graphed. However, specific designs selected allow certain interpretation of data controls for the conclusions to be reliable and believable.

3.3 Variables

According to Creswell (2005), a variable is a characteristic or attribute of an individual or an organization that researchers can measure or observe. This makes the key ideas that researchers seek to collect information on to address the purpose of the study (Creswell, 2005).

3.3.1 Independent Variables

An independent variable is a variable that brings about change in another variable. In single-subject cases an independent variable is the practice, intervention, or behavioural investigation (Horner, Corr, Halle, McGree, Odom, & Wolery, 2005). According to Fraenkel and Wallen (2010) independent variables are those that the researcher chooses to study in order to assess their possible effects on one or more variables. In other words an independent variable is presumed to influence another variable. In this study, independent variables were child to child physical activities that influenced the psychosocial behaviours among learners with severe intellectual disabilities to a meaningful degree of change.

3.3.2 Intervening /Extraneous Variables

Intervening or extraneous variables interfere with the function of the independent variables. According to Kennedy (2005), in single case research, extraneous variables may be the source of behaviour change if not held constant and might confound the interpretation of the results.

Intervening Variables in the current study include disability severity, fear of strangers among learners with SID, pedometer gadget malfunctioning, teachers bias. To cater for extraneous variables, the research assistants worked collaboratively with physical education teachers to avoid a situation where learners with severe intellectual disabilities feared or refused to work with strangers. The first two weeks served as a baseline to ensure mutual cohesion among research assistants and both learners with and without intellectual disabilities. This held fear among learners with SID constant.

The pedometer gadgets were checked before the start of every physical activity that required its use to avoid instrumentation effects of malfunctioning. The research assistants and the PE teachers were well recruited to avoid observer issue phenomenon. Further, repeating observations at mid-test and post-test helped to evidently establish the source of the behaviour change. When extraneous variables influence behaviour, they become threats to internal validity; in this study, they were held constant thus minimized.

3.3.3 Dependent Variable

A dependent Variable is influenced by the independent Variable. It dependents on what the independent variable does to it. According to Kennedy (2005) dependent variables are typically estimates of the behaviours one is analyzing. In single case designs if a functional relation is established, the level of the behaviour being measured is dependent on the presence or absence of the independent variable (Kennedy, 2005). In the current study dependent variables were improved physical and psychosocial behaviours among learners with severe intellectual disabilities.

3.4 Location of the Study

The study was carried out in Kiambu, Laikipia and Muranga Counties' regular and special primary schools for both learners with and without intellectual disabilities. The literature reviewed on the Kenyan context indicates that many studies on physical activities are carried out in Nairobi County neglecting the peri-urban and rural set-ups. Furthermore, very few of these studies reflect learners with severe intellectual disabilities. Again, the researcher has worked in two of the counties and therefore, is familiar with the school's geography. The researcher having been involved in sports of learners with intellectual disability has the hands-on the severe

ones. Also, the three counties were selected to ease the researcher's travel logistics. Thus, Kiambu was selected as a peri-urban and Laikipia and Muranga as rural set-ups.

3.5 Target Population

In single-subject, target population refers to the target problem. Target population is also determined based on whether or not the selection criteria are met by individuals of the general population (Ross & Horner, 2009). The target population for this study was 210 learners with severe intellectual disabilities exhibiting psychosocial behaviour in special schools in selected counties in Kenya. They were selected because they were rarely involved in physical activities compared to their typically developing peers. Similarly, they were rarely involved in PA compared to other levels of the same disability type since they were termed as inactive, sick and behaviour disordered. They were then segregated against in almost all of the school activities. As a result, they experience a lot of psychosocial challenges causing them to exhibit bizarre behaviours aggressively, something that warranted intervention. The researcher realized that most learners with severe intellectual disabilities exhibited aggressive psychosocial behaviours. Therefore the study targeted 210 learners with severe intellectual disabilities as indicated in the matrix Table 3.1. The study had other respondents in support of the data collection; 36 children without ID, 36 parents of learners with severe intellectual disabilities and 36 PE teachers.

3.6 Sampling Techniques and Sample Size Determination

A sample is a small population that is a representative of the general population (Orodho, 2009).Sampling unique cases technique determined the sample of learners with severe intellectual disabilities through inclusion criteria (Majid, 2018).

According to Tashakkori and Teddlie (2008) this is recommended when a specific group of cases is a major focus of the investigation.

3.6.1 Sampling Techniques

In natural settings the issue of sampling is more complex and the best solution to a problem is to base the sampling procedure on the scope of the experimental questions (Kennedy, 2005).Therefore, the current study employed the natural settings of purposive and convenience sampling techniques. In purposeful sampling the researcher intentionally select individuals and sites to study or understand the central phenomenon (Creswll, 2005). On the other hand, convenience sampling is a non-probability where a sample is taken from individuals easy to contact or reach. It depends on the availability of participants who are willing to participate (Ross et al., 2009). Purposive sampling technique was used to select PE teachers and parents who then identified learners with severe ID that exhibited psychosocial problems and had met the inclusion criteria. The researcher used purposive sampling with the hope that those selected (P.E teachers and parents) would provide the required information. Learners without intellectual disabilities were conveniently encouraged to volunteer to participate in physical activities for LWSID and they were matched to those with severe intellectual disabilities exhibiting psychosocial behaviours.

3.6.2 Sample Size Determination

In single-case design eligibility criteria determines whether or not an individual is qualified to be a participant in a research study. These include inclusion and exclusion. According to Majid (2018) inclusion are the main characteristics of the population of interest while exclusion are characteristics that may interfere with the sample size of learners with severe intellectual disabilities. Therefore data collection

was determined by use of inclusion and exclusion criteria and a matrix was developed to show this as indicated in Table 3.1.

Table 3.1: A matrix of the learners selected by inclusion criteria per school, per County

Schools Per County	Enrolment of LWID Per Special School	Learners with Moderate intellectual disabilities	All learners with severe intellectual disabilities	Selected Sample size per school		Total sample size
				LWSID exhibiting psychosocial behaviours Selected from Special Schools	Learners without ID selected form Regular Primary Schools	
KIAMBU						
i. Komothai	117(62m, 55 f)	85	32	5	5	10
ii. Mukeu	52(31m, 21f)	37	15	4	4	8
iii. Karatina	55(25m,30f)	33	22	5	5	10
LAIKIPIA						
i. Ngarenaro	98(68m,30f)	64	34	4	4	8
ii. Muthengea	50(27m,23 f)	40	10	4	4	8
iii. Olng'arua	67(35m,32 f)	39	28	4	4	8
MURANG'A						
i. Percy Davies	67(37m,30 f)	37	30	4	4	8
ii. Don Orion	50(28,22f)	32	18	3	3	6
iii. Kirunguru	52(29m,23 f)	31	21	3	3	6
TOTAL	**608(100%)**	**398(65.46%)**	**210(34.54 %)**	**36 (17.14%)**	**36**	**72**

Table 3.1 indicate that out of 210 learners with severe intellectual disabilities 36(17.14%) met the inclusion criteria. Learners without intellectual disabilities were 36 also since they had to match those with severe intellectual disabilities that met the

inclusion criterion for the pairing purposes. Majority (82.86%) of learners with severe intellectual disabilities did not meet the inclusion criteria due to their health limitations though they exhibited psychosocial behaviours. The sample size for both learners with and without severe intellectual disabilities was 72.

3.6.3 Inclusion Criteria

The study included all learners with severe intellectual disabilities. This is because most of these learners exhibited one or two psychosocial behaviours. This was determined by the information that was reported in the questionnaires for both PE teachers and parents. Moreover, assessment documentation in schools from qualified assessors given by teachers and parents was used to select learners with severe ID who exhibited psychosocial behaviours. Learners without disabilities were also included in the study. They were selected from the immediate regular primary school that neighboured the special schools. This was on a voluntary basis. Those that were willing to participate in the child to child physical activities programme for learners with severe intellectual disabilities were selected after those with severe intellectual disabilities had been identified. They were then paired based on age and gender.

3.6.4 Exclusion Criteria

In the current study, learners with mild (integrated) intellectual disabilities were excluded. Learners with any at-risk health condition were excluded from the study as well. This included those with chronic health problems such as asthma and heart problems. Learners with medical devices such as shunts, for example, those with the hydrocephalous condition were also excluded to avoid interferences with the data collection from PA measuring gadget (Pedometer). Another group that was excluded

was learners with moderate intellectual disabilities though they were the majority (65.46%) in the selected special schools.

3.7 Research Instruments

Instruments are used to gather information and allows for the measurement for or against a particular phenomenon (Orodho, 2009). Research instruments included structured questionnaires for parents and PE teachers as well as physical activities measures gadget (Pedometers). Behaviour and social interaction assessment scales in parents and teacher's questionnaires were used to determine individual learners' sociability before and after child to child programme. Gross motor and sensory motor physical activities skills were assessed through skill performance checklist in the PE teachers' questionnaire. Physical activity level was measured through Pedometers. This was administered to both learners with and without intellectual disabilities. This helped to determine their physical and psychosocial behaviours at the beginning and at the end of the child to child PA programme.

3.7.1 Questionnaire for Parents

Formulating a research question helps the researcher to set the goal of the experiment in single case studies (Kennedy, 2005). To obtain information about the physical activeness and psychosocial behaviours of learners with severe intellectual disabilities, parents were asked with the help of the researcher and the research assistant to give their responses on a 13 item pre-post-test questionnaire. They then gave their views about their children's physical activeness and psychosocial behaviours at the beginning and end of child to child physical activity programme. The questionnaire was subdivided into three sections: section A; contained general information about the parent and the relationship with her/his LWSID, section B;

had information about his/her child's psychosocial behaviours. Section C; sought the parents' views on the effect of the child to child physical activity programmes on their children's behaviour, benefits derived from child to child PA programme and challenges that hinder their children from participating together with other peers without intellectual disabilities. To cater to the questionnaire limitation both the researcher and the research assistant guided the parents on the sections to be responded to.

3.7.2 Questionnaire for the PE Teachers

This tool was used to gather more information about LWSID. This questionnaire was administered to PE teachers only. It helped to complement the parents' questionnaire to determine the validity and reliability of the research instruments. The questionnaire obtained information on identification of the psychosocial behaviours among learners with SID, the learners with severe intellectual disabilities involvement extent in PA as well as mastery of gross and sensory motor activities. The questionnaire was subdivided into three sections: section A; had general information about the PE teacher, section B; contained information on learners with SID psychosocial behaviours and assessment before child to child programme, section C; was on rating learners with severe intellectual disabilities behaviour change after child to child physical activities programme, social interaction before and after child to child PA programme, rating learners' gross and sensory motor skills performance before and after child to child PA programme, benefits derived by both learners with and without SID after participating together in child to child PA programme and finally challenges experienced throughout the child to child PA programme. There were no limitations of the P.E teachers' questionnaire as the

researcher monitored and collected the tools the same day. The return late of the teachers' questionnaire was 100%.

3.7.3 Physical Activeness Measure (Pedometers)

Pedometers are instruments used to measure the level of physical activity an individual attain (Physical Activity Guidelines for Americans, 2018). This was done through recording movements of the number of steps a person makes during the active 1 hour of the child to child physical activities performance. Pedometers were used to establish the physical activity levels of both learners with and without severe intellectual disabilities during the organized child to child PA programme. Data obtained from the pedometer step counts was used to rank learners with and without severe intellectual disability according to their PA levels. Pedometers are technology-based measures that are used to provide virtual coaching to help people set and monitor physical activity levels. They can be used alone or combined with other strategies. In the current study questionnaires for parents and teachers were used to compliment pedometers data and this catered for any limitation as concerns the pedometer. Further limitations were catered for by confirming the functional state of the pedometer before use. Low battery was also charged beforehand.

Step counters (pedometers) and other wearable activity monitors combined with behavioural strategies, such as goal-setting and coaching, increase physical activity by providing physical activity level feedback directly to the researchers (Shennar-Golan, 2018). The current research adopted the use of pedometers step counts to compare the physical activeness of both learners with and without severe intellectual disabilities in primary schools in selected counties in Kenya.

3.8 Pilot Study

According to Orodho (2009) piloting is done with a small representative sample to the group that the researcher intends to study. The pilot study was done in three primary schools where the research tools were manipulated and discussed extensively. Each primary school from each of the selected counties ensured same characteristics of the respondents coming from the same locality. The physical activities performance and scoring were demonstrated practically. The pedometer operation and charging were also done manipulatively. Pairing a learner from a special school with another from the immediate neighbouring regular school was also done. The pilot study sample comprised 3 PE teachers, 12 learners with and without intellectual disabilities, 6 parents making a total of 21 respondents. The pre-test was conducted among all the respondents before the beginning of the physical activity programme and it lasted for 2 weeks. A Cronbach's formula method was employed and statistically analysed to determine the reliability of the research instruments.

3.8.1 Validity

Internal validity is a concept that refers to the degree to which a researcher can be confident that an independent variable (child to child physical activities) is what changed the behaviour (psychosocial behaviours). In single-case designs, internal validity is demonstrated by establishing a functional relation between independent and dependent variables (Kennedy, 2005) rather than the controlled baselines. This was confirmed at mid-test and post-test of the PA programme. Tools for this study were validated during the pilot study which took place at Kinamba, St. Patrick and Kirimiri primary schools (regular and special respectively). To determine content

validity, all tools were constructed by the researcher as per the requirements of the study objectives. In the parents' questionnaire, the data on their education level was not collected during the pilot. This is because only a minimal number of them willed to give that information. Therefore, that demographic information was removed in the main data collection questionnaire. Further, the content validity was done by consulting experts' judgment in the area of special and physical education and exercise science departments where they guided on the key items necessary for data collection. Measures (criterion) of the same construct tools were checked for accuracy. The baseline of the current study was uncontrolled. This meant that the first approach was to adapt existing practices as the context for establishing baselines (Kennedy, 2005). This included the learners' level of initial physical activeness and the magnitude of the psychosocial behaviours exhibited. Once the uncontrolled baseline was established, physical activity intervention was then implemented and improvements noted at mid-test and post-test. As such, there was no expectation that behaviours would improve during baseline. Therefore, the current study uncontrolled baselines were reasonable for demonstrating the effectiveness of the new intervention type. This, however, may contribute little additional information to a systematic body of research which would be a further research recommendation of using a controlled baseline.

3.8.2 Reliability

Reliability refers to the consistency of information or scores (Fraenkel Wallen, 2010) Reliability was ascertained by drawing comparisons of the results and making a pre-post summary scale of all the questions on the same gross and sensory motor PA skills performance, psychosocial behaviour changes as well as physical activity

level rating scales. During piloting, the same group of participants was used for the three levels of testing (pre-test, mid-test and post-test). A Cronbach's alpha formula was used to calculate the coefficient index as indicated below:

Cronbach's Formula

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

N = the number of items

C = average covariance between item-pairs

V = Average variance

Cronbach's alpha correlation coefficient of 0.70 was considered to be highly reliable at determining internal consistency. Therefore, the reliability of the questionnaire was achieved.

3.9 Data Collection Techniques

Data is collected by administering an instrument and then code it for analysis (Creswell, 2005).Data collection took 12 weeks to allow enough time to gather information. The researcher started by delivering copies of permit and letters of introduction to the heads of institutions to inform them and seek their permission to carry out the study in their schools. The researcher then collected data through questionnaires and a validated instrument (Pedometers) for measuring physical activity level for both learners with and without ID. The researcher monitored the questionnaire filling and collected them upon completion the same day. To parents, the researcher prompted where the question was difficult to grasp. Questionnaires were explained in two languages; English and Kiswahili depending on the respondents' choice. Questionnaires were structured in a way that they contained

minimal open-ended questions. Photographs and videos of the physical activities' performance were also taken to show the progress of the child to child physical activities performed in the programme. The photo/video taken only strengthened and confirmed information of field practice of the activities. This only helped the researcher to remember the activities flow during analysis as it was not meant to be a data collection research instrument in the study per se.

The child to child physical activity programme included learners with and without intellectual disabilities. Learners with intellectual disabilities included were only those with severe conditions. Participation was done in 12 weeks within a stipulated school term with two post-tests at 6 weeks half-time and 12 weeks full-time respectively. This was done 2 days per week for 60 minutes and 10 minutes per individual activity. According to International Key Guidelines for physical activities (Piercy et al.,2016), it is important to provide young people with opportunities and encouragement to participate in physical activities that are enjoyable and appropriate for their age as well as offering variety. These guidelines emphasize that children and adolescents aged 6 - 17 years should do 60 minutes or more of moderate-to-vigorous physical activity daily.

In the current study, children were partnered on a ratio of 1:1. Trained research assistants in collaboration with the researcher and the PE teachers recorded each learner's daily physical activities performance for both learners with and without severe intellectual disabilities. Baseline pre-testing was done in week 1 of the organised PA programme. This made learners familiarize with one another and the thresholds of the physical and psychosocial behaviours were noted. A single-subject design of the A/B/C was appropriate to cater for content validity and avoided taking

the individual back to baseline for intervening again. It involved observing and measuring physical and psychosocial behaviour changes during a one-week trial period (A), administering an intervention (Physical activities), measuring the behaviour (physical and psychosocial behaviour) after the intervention at half-time (B) and the end of the programme (C). Every perceived change in physical and psychosocial behaviour became a new baseline at half-time (6th week) to enable the continuation of behaviour intervention for the 12 weeks of the child to child PA programme. Performance of Gross and sensory motor activities is a learning area in the current competence based curriculum (GoK, 2017). However, the researcher chose and modified the physical activities to fit the recreational intent of the study.

3.9.1 Recruiting and Training of Research Assistants and PE Teachers

According to Kennedy (2005) researchers need to identify and select observers who can serve as data collectors. The researcher had been involved in many of the Special Olympics Games and Sports activities as well as training. This includes coaching learners with intellectual disabilities in those games and sports for over ten years. The researcher had also worked in the ministry of education as a teacher trainer of trainers in games and sports for learners with intellectual disabilities for several years. The researcher was, therefore, able to train the research assistants as well as the P.E teachers on the physical activities appropriate for the low ability group (learners with severe intellectual disabilities) as categorized by the Special Olympic International (McConkey, Peng, Merritt, & Shellard, 2019). In Special Olympic Games and sports for learners with intellectual disabilities, the learners are categorized as being elite or low ability. The low ability group undergoes further division according to age and capability. In the current study the age group

comprised learners with severe intellectual disabilities aged 10-15 years without going deeper into a division within a division or a division on its own. The researcher chose 8 university research assistant students who already coached in Special Olympics Kenya for young athletes' programmes and had taken a course in special needs education. Therefore, the research assistants were eligible to be involved in the current study and bias limitation was catered for. The research assistants also were well versed with the physical activities already since they had been involved in Special Olympic Kenya where most of the activities were adopted from by the researcher.

The training of the research assistants took two weeks that is two days in a week where they were trained on the pedometers operation as well as measurement and scoring of the physical activities. The training also involved the administration of the parents and PE teachers' questionnaires. The pre-test training was performed on the physical activities measures as well as the PE teachers' and parents' questionnaires in the three piloted special schools in the three selected counties. The three special and regular schools were not included in the main study.

3.9.2 Performance of Gross Motor Activities

a) Assisted 10-meter walk

Two children without intellectual disabilities were instructed to hold one child with severe intellectual disabilities whose motor activities were limited such that he/she could not walk on his/her own. The two children were then instructed to wait for the child with severe intellectual disability to take one step forward before they take their one step as well, wait for the child to take the other step, then they take theirs. They were also instructed to pause when the child seemed tired. Further, they were

instructed to motivate the child by praising him/her whenever a step is made. The PE teacher and the research assistant walked with them observing every step, and guiding learners without ID on when to pause and as well as when to begin their movement.

b) 25- and 50-meters dash

In this activity, the learners without intellectual disabilities were instructed to run first. In this activity, the females were separated from the males so that they each ran differently. A pedometer was placed on their sports short waist and the readings were zero before they ran. Immediately they finished running, the pedometer readings were read and noted in writing by both the research assistants and PE teachers. Later learners with and those without severe disabilities were paired. Learners without severe intellectual disabilities were instructed to run at the pace of those with severe intellectual disabilities and they were instructed to motivate them with words like “let us run” in whichever language that a learner with ID understood best. Two languages were used that’s “Kiswahili” and “Kikuyu”. The ‘Kiswahili’ word for lets’ run was “tukimbie” while for the Kikuyu was “tuteng’ere”. At this juncture, the pedometer was only worn by those learners with intellectual disabilities.

c) Standing long jump

In this gross motor activity, learners without severe intellectual disabilities were instructed on how to swing their hands to and from before a ‘jump’, how to position their legs together for a jump and finally how to make a jump. They were then instructed to do it before their partners with severe intellectual disabilities so that they can imitate. The PE teachers and the research assistants then instructed the

learners with severe intellectual disability to imitate what their partners were doing. The precaution was taken not to allow them to do it together to avoid obstruction and accidents that would have caused injuries. Learners without intellectual disabilities were advised to motivate their peers with severe intellectual disabilities to perform the activities. The research assistant then measured the distance of every jump made by both learners with and without an intellectual disability for a maximum of three times per jump. Each time a learner with severe ID made a jump his or her partner would commend him/her with motivating words like ‘very good’.

3.9.3 Performance of Sensory Motor Activities

a) Walking along with obstacles

Obstacles were arranged in a straight line leaving a gap of 60 centimetres in between obstacles. The learners without ID were trained on how to go in and out of every obstacle without knocking them down. If one was knocked down it was considered a lost score. The pairing was then organized in a manner that the learner with severe ID followed his/her peer in tackling the two obstacles. The pairs did this twice, thereafter; the learner with SID was made to attempt it alone.

b) Soft Ball Throw

In this physical activity, learners with and without severe intellectual disabilities were paired according to their own partner choice. Those with severe intellectual disability were given priority to choose. However, those not able to respond to their partner’s choice were chosen by those without severe intellectual disabilities not chosen. Those without an intellectual disability were instructed to be calm and understanding towards their peers who had a severe intellectual disability in case they failed to respond to instruction or just withdrew or even decide to move to

another choice. The learners without intellectual disabilities were further instructed to freely allow their peers to switch partners if they wanted. Concerning this, only one case was observed in one of the Laikipia County schools.

Learners without an intellectual disability were made to throw the softball after a demonstration was done by the PE teacher and the research assistant. Learners with severe intellectual disability were then instructed to do it by those without. Where there was no response observed, the PE teacher intervened until the two learners could throw the ball without any coordination. Research assistants measured in metres any attempt throws made by both learners with and without intellectual disabilities. The individual child's measurement was recorded for three consecutive attempts. This was done at pre-test, mid-test and at post-test.

c) Tennis Ball Catch

Learners without an intellectual disability were trained by the research assistant and the PE teachers on how to handle and throw the ball to learners with severe intellectual disabilities. They were cautioned on distance adaptation since a learner with severe intellectual disability would only be able to catch the ball at 1-metre distance as stipulated. They were also advised and assisted to reduce the distance by ¾ and ½. In some instances, the learners with severe ID were very fearful when the ball landed very close to them; in this case, however, learners without an intellectual disability were advised to throw the ball softly and at a low speed to avoid such fears. Any ball caught was counted as a score attained and a score lost if a learner didn't catch the ball. Learners without an intellectual disability were paired with those with intellectual disability.

3.10 Data Analysis

Data were coded and organized according to the themes of the study. The researcher developed themes from the parents and PE teachers about physical and psychosocial behaviours of learners with severe ID before child to child PA programme, the extent of learners with severe ID involvement in PA, learners with severe ID behaviour and interactions change ratings, effects of child to child physical activities on learners' physical and psychosocial behaviours, the involvement of both learners with and without ID in physical activities and rating learners' with severe ID performance in gross and sensory motor skills. Statistical Package Software for Social Sciences (SPSS version 22.0) was used to analyse data from questionnaires and observations rating scales in the same questionnaires. On the other hand, physical activity levels for both learners with and without intellectual disabilities were read from Pedometers step count gadgets. The readings were indicated in a table comparing pre-post PA measures. This was at pre-test, mid-test (6 weeks) and at the end (post-test) of the programme (12 weeks). The researcher used descriptive and inferential statistics of the variables and wrote their relationships and differences with other scholarly works from global, regional, national and the study locale.

3.10.1 Analysis of Quantitative Data

This study used both descriptive and inferential statistics to analyse quantitative data obtained from questionnaires. Descriptive statistics help to analyze descriptive questions (Creswell, 2005). Data were coded, entered and channelled to software outliers of the Statistical Package Software for Social Sciences (SPSS version 22.0) and improper entries were removed before analysis. The hypotheses were tested at P-value using two-sample t-tests value as indicated in chapter four. Hypothesis Ho_1,

Ho_2, Ho_3, were tested using inferential statistics; simple linear regression and sample t-tests plotted in graphs.

3.10.2 Analysis of Qualitative Data

According to Ritchie and Lewis (2006) the content of index varies with the type of qualitative data being undertaken. It could be thematically based on use of language or descriptive categories. Descriptive statistics were used to analyse qualitative data in the questionnaires where data were coded into themes before analysis and reported in frequencies and percentages. However, a few data were reported through narrative verbatim.

3.11 Logistical and Ethical Considerations

The researcher got authorization to research the Ministry of Higher Education, Science and Technology and National Council for Science and Technology, through Kenyatta University's Ethics Review Committee. The researcher in person visited the schools and informed the headteachers of the various schools before carrying out the study and dates were set and communicated in advance. This ensured ethical respect for the authority as well as creating a good rapport with them. While collecting data, the researcher established a rapport through prolonged engagement and sought consent from the respondents before commencing photo/video-taking. The researcher also assured the respondents about the confidentiality of the information they were giving that it was to be used for the study only. For logistic purpose fields were cleared of any damaging object before activities performance to ensure the safety of learners with severe intellectual disabilities and their typically developing peers. Participants were coded using numbers to avoid using their real names. Further, participation in the study was voluntary. Parents and PE teachers

who voluntarily accepted to participate were requested to sign a consent form for themselves and their children. They were also asked to keep any child's information confidential to avoid any anomalies during the child to child PA programme and in future. Lastly, participants' photographs and videos were blurred to hide individual faces' identity.

CHAPTER FOUR

PRESENTATION OF FINDING, INTERPRETATION AND DISCUSSION

4.1 Introduction

The purpose of the study was to assess the effectiveness of child to child physical activities in managing physical and psychosocial behaviours among learners with severe intellectual disabilities. This chapter entails the research findings on the data collected through structured questionnaires administered to the PE teachers and the parents of the learners with SID. Experimental activities' measurements were done using pedometers for both learners with and without severe intellectual disabilities from the three selected counties as stipulated in the previous chapter. The data were analysed using the Statistical Package for Social Sciences (SPSS version 22.0) computer programme. The research findings were analysed according to the demographic information of the study respondents and objectives. Data were presented in Graphs, Tables and Figures. The purpose of the study was to assess the effectiveness of child to child physical activity in managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya. The objectives and hypothesis of the study included:

i. To identify the psychosocial behaviours of learners with severe intellectual disabilities given by teachers and parents before organised child -to- child physical activity programmes in primary schools in selected counties in Kenya.

ii. To explore the extent to which learners with severe intellectual disabilities are involved in child to child physical activity programmes in primary schools in selected counties in Kenya.

iii. To compare teachers and parents rating of the effects of physical activity on psychosocial behaviours of learners with severe intellectual disabilities before and after organised child to child physical activity programmes in primary schools in selected counties in Kenya.

iv. To determine the effects of child to child physical activity on physical activity levels of learners with and without intellectual disabilities before and after the organized child to child physical activity programmes in primary schools in selected counties in Kenya.

v. To compare the gross and sensory motor skills performance of learners with severe intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

vi. To establish benefits derived by both learners with and without intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya

vii. To establish the challenges faced by PE teachers when involving learners with severe intellectual disabilities exhibiting psychosocial behaviours in organised child- to -child physical activity programmes in primary schools in selected counties in Kenya.

Research Hypothesis

H01. There is no significant difference between teachers and parents rating of the effect of child to child PA on psychosocial behaviours among learners with severe intellectual disabilities before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

H02. There is no significant difference between physical activity levels of learners with and without severe intellectual disabilities before and after the organised child-to- child physical activity programmes in primary schools in selected counties in Kenya.

H03. There is no significant difference in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after the organised child to child physical activity programmes in primary schools in selected counties in Kenya.

4.2 Demographic Information of the Study Respondents

This section presents demographic information of P.E teachers, parents and learners with and without intellectual disabilities. The study was conducted in three selected Counties namely; Kiambu, Murang'a and Laikipia. In each County, three special schools that neighboured a regular mother primary school were selected giving a total of six schools (3 special education and three regular primary schools) to enable the pairing of learners with and without intellectual disabilities in an organized PA programme. In total, 18 schools were involved (9 special education schools and 9 regular primary schools).

4.2.1 PE Teachers' and Parents' Demographic Information

Table 4.1 indicates PE teachers and parent's information on their gender in which was statistically reported in frequencies and percentages. The grade level, specialization and working experience for the P.E teachers were also established and statistically reported as well in frequencies and percentages where n=36. During piloting only 3 parents were willing to give their grade level the reason this was not asked during the main study.

Table 4.1: PE Teachers and parents demographic information

	Teachers (N = 36)		**Parents (N = 36)**	
Demographic information	**Frequency**	**Percent**	**Frequency (N = 36)**	**Percent**
Gender				
Male	20	55.6	12	33.3
Female	12	33.3	24	66.7
Non-committal	4	11.1	-	-
Grade level			-	-
P1	1	2.8	-	-
Diploma	11	30.6	-	-
Degree	16	44.4	-	-
Master's degree	4	11.1	-	-
PHD	1	2.8	-	-
Non-committal	3	8.3	-	-
Specialization			-	-
Special education	32	88.9	-	-
Non-committal	4	11.1	--	-
Working experience			-	-
1 – 5 years	6	16.7	-	-
10 – 15 years	6	16.7	-	-
Above 15 years	19	52.8	-	-
Non-committal	5	13.9	-	-

Table 4.1 presents the teachers' demographic information which included gender, grade level, specialization and working experience was established. The parents' demographic information included gender only. According to the findings, the PE teachers for learners with intellectual disabilities were mainly male at 55.6% while

females were 33.3%. However, majority of the parents who responded to the questionnaires were females (66.7%). This is because female parents were the ones that brought their children to the reopening of the school. This coincided with the researchers' time of visiting the schools for data collection hence the choice of the available parent as per that time. Most of the PE teachers (44.4%) had a degree level of education while 30.6% had Diploma education. The highest level of education attained was a PhD which was only one PE teacher (2.8%). The teachers handling these learners were special education trained teachers as indicated by 88.9% of the PE teacher respondents. Majority of special education teachers were specialists in P.E because they must have taken a unit of adapted physical education at diploma or degree levels.

In their teaching profession, 52.8% of the teachers had worked for more than 15 years, whereas 16.7% had worked for 10 – 15 years, 16.7% for 1 – 5 years while 13.9% of the teachers were non-committal and did not indicate their years of service. The researcher did not ask the parents' education level since, during piloting, 92% of the parents were not comfortable with the question in the questionnaire as they did not respond to it. Therefore, the researcher opted to remove the question in the main study. All in all, parents had other important information to respond to concerning their children with severe intellectual disabilities as shown in Table 4.1.

4.2.2 Parents' Relationship with the SID Children

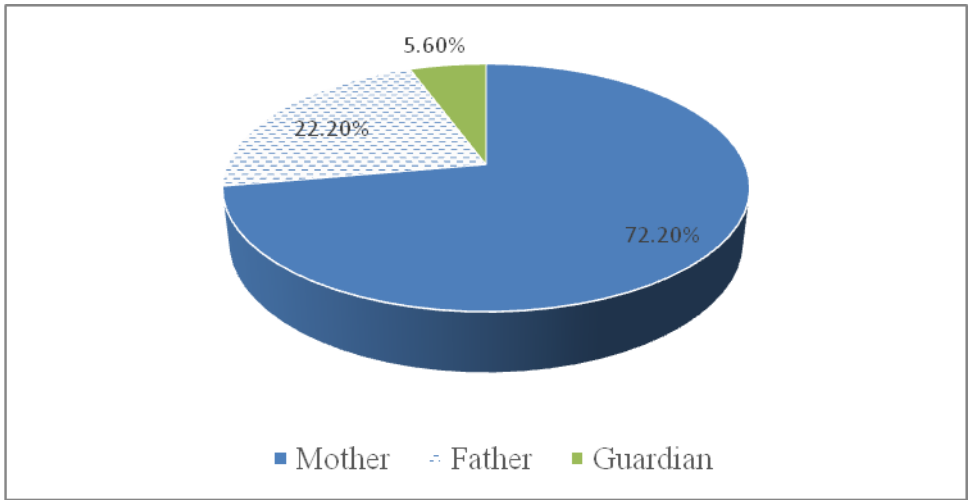


Figure 4.1: Relationship of the parents with the learners with SID

Out of the 36 parents of learners with severe intellectual disabilities, 72.2% were mothers of the sampled learners who had a severe intellectual disability, 22.2% were fathers of the children while 5.6% were guardians of the children as indicated in Figure 4.1. Majority of the parents were mothers to the children as at the time of data collection. Most mothers brought their children back to school during the time of data collection hence their large number.

4.2.3 Birth Position of the Children with Severe Intellectual Disabilities

Table 4.2: The birth position of the children

Birth position	Frequency (N = 36)	Percent
First	11	30.6
Second	4	11.1
Third	3	8.4
Fourth	2	5.6
Fifth	7	19.4
Others	9	25

In the families, 30.6% of the children were the firstborn. This number forms the majority of the learners with intellectual disability and was followed by others in their families who accounted for 25.0% out of the 36 families. Other 19.4% of the children were fifth born whereas 11.1% were second-born. Third born (8.4%) and fourth born (5.6%) were minimally affected as shown in table 4.2. It only can be conceptualized that at the first birth of a child parents are very young and may not have attended ant-natal clinics during the first trimester of pregnancies hence fail to prevent congenital causes of intellectual disabilities. On the other hand, others (beyond 5^{th} born) that followed would have resulted from very old mothers giving birth to children with intellectual disability as this is one of the congenital causes also.

4.2.4 Time Parents Realized their Children had Severe Intellectual Disability

Table 4.3: Time parents realized their children had severe intellectual disability

Child age the parents noted the unique problem	Frequency (N = 36)	Percent
Age 1 – 5 years	33	91.7
6 – 11 years	2	5.6
11 – 15 years	1	2.8

Parents realized this problem mainly in the earlier years when the children were in the ages of 1 – 5 years. Therefore, majority of the parents, 91.7% realized their children were having problems when the children were 1 – 5 years old; 5.6% of the parents realized when their children were 6 – 10 years old whereas one parent (2.8%) noted the child had a problem at 11 – 15 years old as indicated in Table 4.3. A severe disability is identified during the formative years of a child hence majority

realized their children had a problem. This is noticeable due to limitations in adaptive behaviours such as feeding and dressing among others (Gigi et al., 2014).

4.2.5 Learners who Completed Participation By Gender

Table 4.4: Learners who completed participation by gender

Gender	Learners with SID	Learners without ID
Boys	20 (56 %)	17 (47 %)
Girls	16 (44 %)	19 (53%)
Total	**36 (100%)**	**36 (100%)**
χ^2-value	0.500	
P –value	0.638	

In table 4.4 the learners' gender showed that out of the 72 learners, 51.4% males and 48.6 % of females completed the research PA programme. Among the children with severe intellectual disability, 56% were males whereas 44% were females. Those who had no severe intellectual disability were 47% males and 53% females. There was no significant difference in the gender that completed the PA programme (χ^2 = 0.500, P = 0.638).

According to McConkey, Peng, Merritt and Shellard, (2019) when partnering learners with and without intellectual disability in PA, the number of those without intellectual disability must not be less than those with ID. In this case, the research results for females agreed with this principle while for males it did not. On the other hand, this study finding agrees with Bedell et al. (2013) that children and youth with disabilities get involved less in organized physical activities (10%) compared to their typically developing peers (37%). This could be due to the disability severity that makes them be prone to sicknesses either at the beginning of the PA

programmes or at the end. The same case happened to male LWSID in the current study. This further indicated that it is very rare to have all the included respondents with ID at the beginning of the study completing the PA programmes, this is due to disability severity challenges.

4.3 Identification of Learners with Severe Intellectual Disabilities

In the first objective teachers and parents were asked to identify the psychosocial behaviours that their learners with severe intellectual disabilities exhibited. Identification of psychosocial behaviours exhibited by learners with severe intellectual disabilities was as noted in table 4.5 and 4.6.

4.3.1 Identification of Psychosocial Behaviours Exhibited by Learners with Severe Intellectual Disabilities

Table 4.5: Teachers' identification of psychosocial behaviours exhibited by learners with severe intellectual disabilities

Externalized behaviour	Not at all (%)	Rarely (%)	Sometimes (%)	Often (%)	Most of the times (%)	Mean
Withdrawal	5 (13.9)	8 (22.2)	7 (19.4)	3 (8.3)	8 (22.2)	3.03
Anger	4 (11.1)	12 (33.3)	9 (25.0)	3 (8.3)	2 (5.6)	2.57
Screams	14 (38.9)	9 (25.0)	6 (16.7)	2 (5.6)	1 (2.8)	1.97
Crying for no reason	13 (36.1)	8 (22.2)	4 (11.1)	3 (8.3)	2 (5.6)	2.10
Hitting others	17 (47.2)	6 (16.7)	4 (11.1)	3 (8.3)	-	1.77
Hitting objects	20 (55.6)	4 (11.1)	2 (5.6)	4 (11.1)	-	1.67
Temper tantrums	10 (27.8)	9 (25.0)	7 (19.4)	5 (13.9)	2 (5.6)	2.39
Running away from peers	17 (47.2)	3 (8.3)	2 (5.6)	6 (16.7)	4 (11.1)	2.28
Biting others	17 (47.2)	7 (19.4)	4 (11.1)	1 (2.8)	1 (2.8)	1.73
Expulsion from peer related activities	8 (22.2)	5 (13.9)	4 (11.1)	10 (27.8)	7 (19.4)	3.09
Showing excessive fear	8 (22.2)	7 (19.4)	5 (13.9)	8 (22.2)	6 (16.7)	2.91
Shyness	7 (19.4)	8 (22.2)	4 (11.1)	11 (30.6)	4 (11.1)	2.91
Physical activities skill deficit	1 (2.8)	-	1 (2.8)	-	34 (94.4)	4.86
Hyper active	-	-	-	-	15 (41.7)	5.00

In table 4.5 majority of the teachers realized that learners with severe intellectual disability had physical activities skill deficit (94.4%), others showed hyperactive (41.7%) and others exhibited withdrawal behaviours (22.2%). These learners sometimes exhibited anger (25.0%), temper tantrums (19.4%) and screams (16.7%).

From the current study results, many challenging psychosocial behaviours were reported among children with severe intellectual disabilities in special primary

schools. Similar behaviours were noted by Adamek et al. (2011) study. The study noted five behaviours that were referred to as challenging including aggression, self-injuries, destructiveness, stereotypes and sleep disorders. The aggression behaviour ranging from 39.5%- 87.5% in Adamek et al. (2011) was also reported in the current study same for anger (8.3%) + 5.6% =13.9%, screams 5.6% +2.8% =8.4%, crying for no reason 8.3% + 5% =13.9%, hitting others 8.3%, hitting objects 11.9%=20.2, temper tantrums 13.9% + 5.6% =19.5%, biting others 2.8% + 2.8% = 5.6% and all cumulatively was 80.7 which concurred with Adamak, Nichols, Tetenbaun, Bregman, Ponzio and Carr (2011) range of 39.5%-87.5%. Adamak et al. (2011) affirm that precipitating factors for aggression are not entirely certain. It could be one or a combination of the above segments of aggression. The researchers attest that such challenging behaviours could be as a result of children with severe intellectual disability expressing them in an attempt to avoid unpleasant situations. At other time this could be defence mechanisms or a means of obtaining something like an object. This however could be managed through proper coping mechanisms such as physical activities to reduce the further manifestation of the psychosocial behaviour.

Table 4.6: Parents' identification of psychosocial behaviours exhibited by learners with severe intellectual disabilities

Externalized behaviour	Not at all (%)	Rarely (%)	Sometimes (%)	Often (%)	Most of the times (%)	Mean
Withdrawal	3 (8.3)	9 (25)	5 (13.9)	6 (16.7)	7 (19.4)	3.17
Anger	5 (13.9)	8 (22.2)	7 (19.4)	6 (16.7)	2 (5.6)	2.71
Screams	7 (19.4)	10 (27.8)	8 (22.2)	2 (5.6)	1 (2.8)	2.29
Crying for no reason	7 (19.4)	7 (19.4)	9 (25)	3 (8.3)	1 (2.8)	2.41
Hitting others	8 (22.2)	9 (25)	7 (19.4)	2 (5.6)	-	2.12
Hitting objects	8 (22.2)	12 (33.3)	3 (8.3)	4 (11.1)	-	2.11
Temper tantrums	5 (13.9)	6 (16.7)	12 (33.3)	6 (16.7)	-	2.66
Running away from peers	11 (30.6)	7 (19.4)	2 (5.6)	5 (13.9)	3 (8.3)	2.36
Biting others	10 (27.8)	10 (27.8)	3 (8.3)	2 (5.6)	-	1.88
Expulsion from peer related activities	6 (16.7)	6 (16.7)	4 (11.1)	7 (19.4)	5 (13.9)	2.96
Showing excessive fear	10 (27.8)	7 (19.4)	5 (13.9)	5 (13.9)	3 (8.3)	2.47
Shyness	4 (11.1)	9 (25)	10 (27.8)	5 (13.9)	2 (5.6)	2.73
Physical activities skill deficit	1 (2.8)	1 (2.8)	7 (19.4)	3 (8.3)	22 (61.1)	4.29

In table 4.6 parents stated that children with severe intellectual disabilities had physical activities skill deficit (61.1%), showed withdrawal behaviours (19.4%) and expelled from peer-related activities (13.9%). The parents also noted that these children do not always run away from peers (30.6%) neither bite others (27.8%), hit others nor hit objects (22.2%). They do not at times scream or cry for no apparent reason (19.4%) as indicated in Table 4.6. This study finding is in line with Ritchie (2010) where the researcher noted that the learners with severe intellectual disabilities were found to exhibit a multitude of psychosocial behaviours that may have been caused by physical inactivity. In the current study, physical inactivity behaviour was at a higher rate than other psychosocial behaviours (94.4%).

In a research by Sydney (2017), parents realized psychosocial behaviours as challenging behaviours exhibited by children with intellectual disabilities. In that study, many parents and siblings reported 84% of aggressive behaviour as a result of anger compared to 64% (22+19+17+6) in the current study. The current study looked at children with severe intellectual disabilities while the former had a wide scope of all severity levels including mild, moderate and severe. However, when looked at critically in the current study, aggressive behaviour was further segmented as those behaviours that often and most of the times occur. The segments included anger 16.7% + 5.6% = 22.3%, screams 5.6% + 2.8% = 8.4%, crying for no apparent reason 8.3% + 2.8%=11.1%, hitting others 5.6%, hitting objects 11.1%, temper tantrums 16.7%, and biting others 5.6%. This cumulatively was 80.8%, signifying that majority of children exhibiting psychosocial behaviours were those with severe intellectual disabilities. The 3.2% discrepancy with Sydney (2017) was those with mild and moderate intellectual disabilities. What Sydney referred to as bad temper was also reported in the current study as temper tantrums. Another similar behaviour report in that study was hyperactivity as reported in the teachers' psychosocial behaviour assessment scale in Table 4.5. Mankervis, Rosewarre and Vassos (2011) note that parents expressed concern about the increasing difficulty in managing their children's challenging behaviours as they grow physically. This emphasizes the reason this intervention should be put into consideration in all schools to cater for children with severe intellectual disabilities psychosocial behaviours.

Further from Mankers et al. (2011) findings, parents reported that they had sought placement of their children with more severe disability levels elsewhere other than their near home schools. It is evident then that we get children with severe

intellectual disabilities in residential special schools away from parents (Mankers, Rosewarne & Vassos (2011). Physical health was another problem that led Australian parents to place their children in residential (respite) care. This in the current study was referred to as physical inactivity that limited the children's physical movement. The respite or the current special school could not offer parents stress-free life so that they could be able to care for the siblings. This is so because they would often be called half-way through the respite to take their children home. The reason for this call was either because of a child's physical issue or because of unmanageable challenging behaviour. In the current study, physical skill deficit was reported by parents to be the most psychosocial behaviour exhibited by learners with severe intellectual disabilities. This affirms the importance of managing psychological and externalized behaviours among learners with severe intellectual disabilities through child to child physical activity adopted by the current study.

4.4 Learners with Severe Intellectual Disabilities Involvement in Physical Activities

The second objective was about learners with severe intellectual disabilities involvement in physical activity. The extent they were involved in physical activity was analysed by a statistical descriptive as reflected in figure 4.2 and table 4.7. The statistics were given in frequencies and percentages. An inferential statistic was also done to show the variation of involvement per county where the χ^2 and P-value statistical significant of involvement in between the counties was established as indicated in table 4.9.

4.4.1 Involving Learners in Physical Activities in a Week

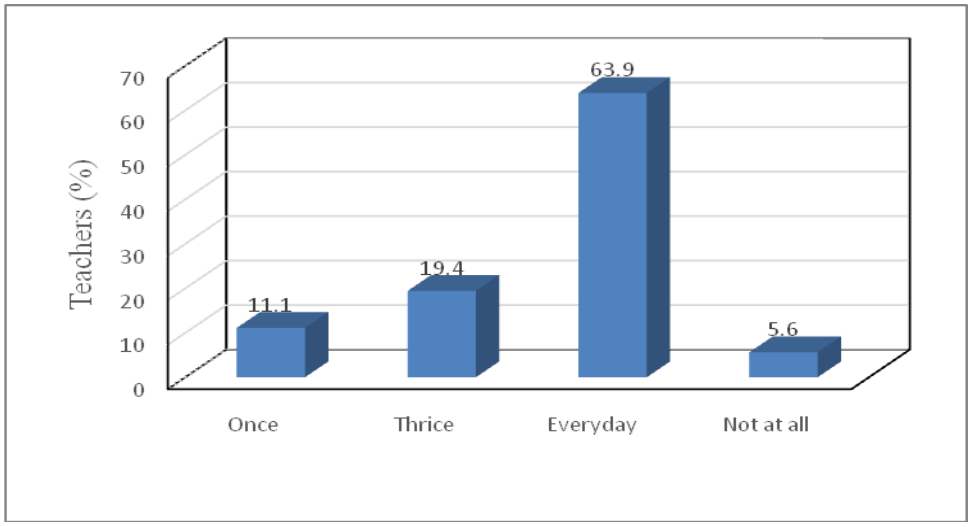


Figure 4.2: Teachers involving learners in physical activities in a week

The study sought to establish the extent to which teachers were involving their learners with severe intellectual disabilities in physical activity in special education primary schools. Teachers reported involving learners in physical activities every day as indicated in figure 4.2 by 63.9% of the teachers. This was followed by 19.45% of the teachers who reported involving these learners thrice in a week, 11.1% involved them once a week and 5.6% of the teachers did not involve the learners in physical activities at all. While involvement should be every day some schools reported not involving their learners with severe intellectual disabilities at all. The Americans guidelines on physical activity emphasize that children and adolescents aged 6– 17 years should do 60 minutes (1hour) or more of moderate-to-vigorous physical activity daily Piercy, et al. 2018). This concurs with Holecko (2016) that sought to establish how often the teachers involved learners with ID in physical activities.

4.4.2 Involvement of Learners Per Disability Severity

Table 4.7: Involvement of learners per disability severity

Learners disability severity	Frequency (teachers' response) N=36	Percentage (%)
Mild	0	0%
Moderate	32	88.9 %
Severe	4	11.1%
Total	**36**	**100%**

When asked to specify the frequency with which they involved learners in physical activities according to disability severity, teachers' response was as indicated in table 4.7 where 88.9 % said they involved those with moderate intellectual disabilities and 11.1% claimed they included those with severe intellectual disabilities while none reported involving those with mild conditions. It was then definite that the reported everyday involvements (63.9%) in Figure 4.2 majority were the moderate group and not the severe ones.

This strengthened the current study's results that the researcher had to involve learners with severe intellectual disabilities because they were less involved in physical activities as reported by some teachers (11.1%) in table 4.7. Therefore, Mwangi's (2016) findings that most learners with ID are segregated and denied play opportunities in school environments concur with these study findings. A case of learners with mild ID was not reported since, in special schools, the categories include moderate and severe to profound as reported verbally by one of the PE teachers:

> *We do not admit children with mild problems as those can learn in the regular primary schools in their locality.*

4.4.3 Involvement of Learners with SID in Physical Activities among County

First, the researcher established the number of special schools in each county that had a neighbouring primary school and then described the frequency of involvement in frequencies and percentages as indicated in table 4.8.

Table 4.8: No of special schools per County

County	**Total schools**	**selected schools**	**Percentage**
Muranga	3	3	100%
Kiambu	4	3	75%
Laikipia	9	3	33%
Total	**16**	9	56 %

Data in table 4.8 indicated that Laikipia County had the majority of the special schools followed by Kiambu and lastly Murang'a. Therefore, the number of selected special schools constituted 100% in Murang'a since all the schools were selected, Kiambu 75% and Laikipia 33%. The researcher purposefully chose 3 schools per county for easy management of learners considering their disability severity. Further, more than 50% of the special schools in the three counties were involved thus affirming the findings.

Table 4.9: Involvement of learners with severe intellectual disabilities in physical activities by the teachers per county per week

Frequency	Laikipia (%)	Muranga (%)	Kiambu (%)	Total
Once	3 (27.3)	1 (7.7)	0 (0.0)	4 (11.1)
Thrice	0 (0)	5 (38.5)	2 (16.7)	7 (19.4)
Everyday	8 (72.7)	7 (53.8)	8 (66.7)	23 (63.9)
Not at all	0 (0)	0 (0.0)	2 (16.7)	2 (5.6)
Total	11 (100)	13 (100)	12(100)	36 (100)
χ^2 value		13.015		
P value		0.043		

In the three counties, teachers' involvement of learners with severe intellectual disabilities in physical activities significantly varied (χ^2 = 13.015, P = 0.043). In Laikipia, most of the teachers (72.7%) involved the learners every day in physical activities, in Murang'a 53.8% of the teachers involved the learners while in Kiambu, 66.7% involved the learners in physical activities every day as shown in table 4.9.

Laikipia County was outstanding in involving learners with intellectual disabilities in physical activities, followed by Kiambu and finally Muranga. When comparing the number of special schools in each County, Laikipia County had the majority of such schools followed by Kiambu and lastly Muranga. This was an indication that Laikipia County embraced learners with ID and probably the reason they also resulted in seeing the need to involve them in physical activities more than the other two research counties. However, they also lagged when it came to involving learners with severe intellectual disabilities. The current findings are in line with Bedell, Coster, Law and Liljenguist (2013) that children and youth with disabilities took less in organized physical activities in the community (10 %) while their typically developing peers highly took part (37%) most of the time. However, the current study did not compare learners with and without severe intellectual

disabilities in these activities as competitors but rather as a support modelling. Learners without SID were used as support to those with severe intellectual disabilities. The researchers further said parents (36%) reported that there was no access to PA programmes services as compared to children without disabilities 3%. Similarly, athletes with severe intellectual disabilities were under-represented in PA competitions around the world (Handicap International, 2015).

4.5 Effects of Child to Child Physical Activities on Psychosocial Behaviours among LWSID by the Mid-test of the organized PA programme

The third objective was critical to the study as it reflected the purpose of the study. It, therefore, had a sub-set of testing hypothesis. The analysis was done in three intervals; pre-test, mid-test and post-test of the child to child PA programme results. A descriptive analysis of the learners' psychosocial behaviour changes before and after physical activities programme was done by observing the child's behaviour through a Likert scale of four-point; no change, little change, so much change and changed completely, referring to what was termed as per the scale as shown in table 4.10, 4.11, 4.12 and 4.13. In measuring the extent of behaviour change, a learner's behaviour change interval was recorded independently by the researcher in collaboration with the P.E teachers and the research assistants. The frequency with which the behaviour occurred was noted per day and a scale of change was determined by percentage. Therefore, each of the learners with severe ID had his or her scale of behaviour change measured. The inferential analysis was also done to test the hypothesis using the mean deviation and the paired sample t-test and as indicated in table 4.14 and 4.15.

4.5.1 Teachers Rating Changes in Psychosocial Behaviours among Learners with Severe Intellectual Disabilities at Mid-test of the Programme

Table 4.10:Teachers rating changes in psychosocial behaviours among learners with severe intellectual disabilities at mid-test of the programme

Externalized behavior	No change (%)	Little change (%)	So much change (%)	Changed completely (%)
Withdrawal	2 (5.6)	5 (13.9)	1 (2.8)	-
Anger	1 (2.8)	3 (8.3)	-	-
Screams	2 (5.6)	-	-	-
Crying for no reason	3 (8.3)	1 (2.8)	-	-
Hitting others	2 (5.6)	-	-	-
Hitting objects	1 (2.8)	2 (5.6)	-	-
Temper tantrums	2 (5.6)	3 (8.3)	-	-
Running away from peers	3 (8.3)	5 (13.9)	1 (2.8)	-
Biting others	2 (5.6)	3 (8.3)	-	-
Expulsion from peer related activities	5 (13.9)	12 (33.3)	-	-
Showing excessive fear	5 (13.9)	11 (30.6)	-	-
Shyness	6 (16.7)	12 (33.3)	-	-
Physical activities skill deficit	3 (8.3)	28 (77.8)	1 (2.8)	-
Hyper active	7 (19.4)	13 (36.1)	-	-

At the mid-test of the child to child PA programme, teachers noted changes in learners' psychosocial behaviour. The analysis indicated that few learners with SID had so much change in physical activities skill deficit (2.8 %), running away from peers' behaviour and withdrawal behaviour of the learners was similarly noted by 2.8% of the teachers respectively. Majority (77.8%) of the teachers realized little change in the learners' physical activities skill deficit, while others (33.3%) noted little change in learners' shyness. Some teachers (30.6%) also recorded little change in the learners showing excessive fear and little change (13%) in running away from peers as indicated in table 4.10. The findings indicated a slower pace of psychosocial behaviour change at mid-test. This was because learners with severe

intellectual disabilities and their typically developing peers were still socializing and much physical activity practice had not been done. This also included learners familiarizing with the new gross and sensory motor PA skills and as such no rigorous activities were done enough to cause much change in any of the behaviours. Considering this had not happened any other time, learners with severe intellectual disabilities needed more time to accept new people (research assistants, researcher and regular learners).

4.5.2 Parents Rating Changes in Psychosocial Behaviours among Learners with Severe Intellectual Disabilities at Mid-test

The researcher guided the parents on the questionnaire items where they were asked to indicate changes that they noted among their children with severe intellectual disabilities at mid-test of the child to child PA programmes. The result of their response was statistically done through frequency and percentages as noted in table 4.11.

Table 4.11: Parents rating changes in psychosocial behaviours among learners with severe intellectual disabilities at mid-test

Changes in Behaviour	Frequency (n = 36)	Percent (%)
No change	1	2.8
Little change	3	8.3
Moderate change	4	11.1
So much change	26	72.2
Changed completely	2	5.6

In table 4.11, information gathered from parents showed that child to child physical activities programme had changed their children's behaviour. Majority of the parents (72.2%) noted so much change in their children's behaviour. Others (11.1%) reported moderate change in their children's behaviour while a small number of

them (5.6%) recorded a complete change in their children's behaviour. Most parents were excited when they realized their children's psychosocial behaviour changes hence the high number reporting so much change.

4.5.3 Teachers Rating Changes in Psychosocial Behaviours among Learners with Severe Intellectual Disabilities at the End (post-test) of the Child to Child Physical Activity Programmes

At the end (post-test) of child to child PA programme, learners with severe intellectual disabilities psychosocial behaviour change was determined by the use of descriptive statistics. This was given in frequencies and percentages as in table 4.12.

Table 4.12: Teachers rating changes in psychosocial behaviours among learners with severe intellectual disabilities at the End (post-test) of the Child to Child physical activity programmes

Externalized behavior	No change (%)	Little change (%)	So much change (%)	Changed completely (%)
Withdrawal	1 (2.8)	1 (2.8)	5 (13.9)	
Anger	1 (2.8)	-	3 (8.3)	-
Screams	1 (2.8)	1 (2.8)	-	-
Crying for no reason	2 (5.6)	2 (5.6)	-	-
Hitting others	1 (2.8)	1 (2.8)	-	-
Hitting objects	1 (2.8)	-	1 (2.8)	-
Temper tantrums	1 (2.8)	1 (2.8)	4 (11.1)	-
Running away from peers	1 (2.8)	2 (5.6)	4 (11.1)	-
Biting others	1 (2.8)	1 (2.8)	3 (8.3)	
Expulsion from peer related activities	1 (2.8)	4 (11.1)	12 (33.3)	-
Showing excessive fear	1 (2.8)	4 (11.1)	11 (30.6)	-
Shyness	1 (2.8)	5 (13.9)	12 (33.3)	-
Physical activities skill deficit	2 (5.6)	2 (5.6)	27 (75.0)	1 (2.8)
Hyper active	1 (2.8)	5 (13.9)	12 (33.3)	1 (2.8)

As indicated in table 4.12 at the end of child to child physical activity programme, teachers observed complete changes in few learners with SID in physical activity deficit (2.8%) and hyper activeness behaviour (2.8%). They also noted that majority of learners with SID had so much change in shyness (33.3%), expulsion from peer-related activities (33.3%), hyperactivity (33.3%) and showing excessive fear (30.6%). Further, the teachers noted learners with SID had so much change (11.1%) in temper tantrums and so much change (11.1%) in running away from peers. The percentages denoted changes in psychosocial behaviours thus a significant difference between 'the before' and 'after'. Most children showed physical skill deficit improvement at the end of the PA programme. There was a sign of complete change in few learners with SID in physical activity deficit as denoted by Kelso (2014) that regular exercise can build muscles hence strong stamina in them.

According to Page (2016), physical activity has been shown to benefit not only health outcomes in people with ID but also reduce challenging behaviour as it is stipulated in table 4.12. This change of emotional behaviours after exposure to physical activity is supported by Bechar and Grosu (2016) who report that physical activity may influence social-emotional behaviours among other areas of functioning. Similarly, Artekin, Bayazrt and Colak (2014) agree that adopted physical activity applied on students with intellectual disability positively affect the level of emotional adjustment, self-managing and socialization behaviours among students. That means learners socialization scores increased and emotional adjustment problems decreased when comparing scores as at the beginning and end of the physical activities. This is also in agreement with Page (2016) findings that the intensity of the physical activity used may affect the reduction of challenging

behaviours. Such behaviours include aggression, resulting from too much anger. For this reason, the current study used different physical activities both in sensory and gross motor skills. This gave LWSID a chance to at least get involved in one or more activities depending on the child's capability and severity of the disability. This became a confirmation that interventions based on theories of behaviour change are successful in helping people achieve an active lifestyle. This involves applying knowledge that teaches people skills that help them incorporate physical activity into their daily routines (Piercy et al., 2018). Similarly, the action performed in the fields strengthened the findings as reflected in plates 4.1.

Plates 4.1: Different Activities and behaviour changes in different field

Plate 1a: State due to self- injurious

Plate 1b: Withdrawal behaviour

Plate1c a learner with SID bitting a ball

Plate 1d same learner with SID Cuddling a ball

Plate 2 a: The state of the child due to self-injurious behaviour

Plate 2b: The child refusing to stand with others

Plate 2 c: Cuddling a ball

Plate 2d: Cuddling a plastic tin

Plate 2e: Standing amongst others without sitting during the activities

Plate 3 a: Wrong hand positioning

Plate 3b: Right hands throw positioning

Plate3c: Proper ball reception

In the above plates learners with severe intellectual disabilities change in behaviour was noted in plates 1a to 1d where the child took several stages of change from self –injuries of self-hand biting (1a), withdrawal (1b) and biting the ball (1c) to cuddling the ball (1d). This was a positive response where the initial behaviour of biting-self showed a significant reduction. Same psychosocial behaviour change was noted in plates 2a -2e where the child with self-hand biting (2a) behaviour showed changes progressively from self-injuries to a refusal of standing (2b), cuddling a ball (2c), cuddling a tin (2d) and finally standing(2e) with others as the activities took place.

4.5.4 Parents Rating Changes on Psychosocial Behaviours among Learners with Severe Intellectual Disabilities at the End of the PA Programme

Table 4.13: Parents rating changes on psychosocial behaviours among learners with severe intellectual disabilities at the end of the PA programme

Behaviour Improvement	Frequency (n = 36)	Per cent (%)
No improvement	1	2.8
Little improvement	5	13.9
Moderate Improvement	3	8.3
So much improved	25	69.4
Improved completely	2	5.6

Table 4.13 indicate that majority of the parents (69.4%) noted so much improvement in their children's relationships with others. However, very few of them changed their behaviours completely. This only signified that the disability severity could have limited the total change but much improvement was noted. The study aimed to decrease the behaviour to near-zero as possible. This was supported by the applied behaviour analysts' proponents who stipulated that such findings can be generalized to other settings if the Childs' aggressive and disruptive behaviours decreased to near-zero levels at a clinic (Baer et al., 1968).

4.5.5 A Comparison of Teachers' Rating of Learners with Severe Intellectual Disabilities Psychosocial Behaviours before and after Child to Child Physical Activities (Testing of Hypothesis 1)

Ho1. There is no significant difference between teachers and parents rating the effects of child to child physical activities on psychosocial behaviours among learners with severe intellectual disabilities before and after child to child PA programme in primary schools in selected counties in Kenya.

The hypothesis sought to determine whether there was any significant difference between teachers and parents rating of learners with severe intellectual disabilities psychosocial behaviours before and after child to child PA programme in primary schools in selected counties in Kenya. Mean values showed to be significantly different at $P \leq 0.05$ and these measures led to the rejection of the study hypothesis that there was no significant difference between teachers and parents rating of learners with severe intellectual disabilities psychosocial behaviours before and after child to child physical activities programme. Table 4.14 and 4.15 shows the computation results that lend to the rejection of the null hypothesis one.

Table 4.14: Teacher rating of learners with severe intellectual disabilities psychosocial behaviour before and after child to child PA programme (N=36)

	Rating before		Rating after			
Behaviours	**Mean**	**SE**	**Mean**	**SE**	**t-value**	**p-value**
Withdrawal	4.500b	0.267	1.875a	0.227	7.000	0.0001*
Anger	3.750a	0.946	1.750a	0.250	2.828	0.066
Screams	3.000a	2.000	1.000a	0.000	1.000	0.500
Crying for no reason	3.750a	0.946	1.250a	0.250	2.611	0.080
Hitting others	2.500a	1.500	1.000a	0.000	1.000	0.500
Hitting objects	2.000a	1.000	1.667a	0.333	0.378	0.742
Temper tantrums	3.400b	0.678	1.600a	0.245	3.674	0.021*
Running away from peers	3.667b	0.527	1.778a	0.222	3.507	0.008*
Biting others	2.200a	0.583	1.600a	0.245	1.000	0.374
Expulsion from peer related activities	4.000b	0.284	1.706a	0.114	9.601	0.0001*
Showing excessive fear	3.938b	0.322	1.688a	0.119	7.997	0.0001*
Shyness	3.889b	0.241	1.667a	0.114	8.892	0.0001*
Physical activities skill deficit	4.844b	0.128	2.844a	0.010	11.904	0.0001*
Hyper active	5.000b	0.000	1.643a	0.133	25.262	0.0001*

NB: Mean on a scale of 1 – 5 (1-Not at all, 2-Rarely, 3-Sometimes, 4-Often, 5-Most of the times)
Mean values in the same row denoted by different letters are significantly different at P≤ 0.05.

In table 4.14 rating before and after were compared using a Paired sample t-test. The 'p' values marked with asterisks "*" show that there were highly significant differences between the ratings. The SE (standard error) shows how dispersed the rating was. For example, rating of "Screams" before was very highly dispersed with a SE of 2.00. This was followed by a rating of "Hitting others" before which was 1.500. A rating of "Hitting objects" after the intervention was the most dispersed with an S.E of 0.333 showing a very high significance rating of after to that of before. These findings signified a greater difference of the after behaviours to that of the before. This is an indication that most of the psychosocial behaviours had decreased to a meaningful degree of change after learners participated in child to child PA programme.

Table 4.15: Paired sample t-test for teachers rating of learners with severe intellectual disabilities psychosocial behaviours before and after child to child programme (N=36)

		Paired Differences							
		Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**		**T**	**Df**	**Sig. (2-tailed)**
					Lower	Upper			
Pair 1	Withdrawal	2.635	1.061	.375	1.738	3.512	7.00	7	**.000***
Pair 2	Anger – anger	2.000	1.414	.707	-.250	4.250	2.83	3	.066
Pair 3	Screams- screams	2.000	2.828	2.000	-23.412	27.412	1.00	1	.500
Pair 4	Crying for no apparent reason - crying for no apparent reason	2.500	1.915	.957	-.547	5.547	2.61	3	.080
Pair 5	Hitting others - hitting others	1.500	2.121	1.500	-17.559	20.559	1.00	1	.500
Pair 6	Hitting objects - hitting objects	.333	1.528	.882	-3.461	4.128	.378	2	.742
Pair 7	Temper tantrums - temper tantrums	1.800	1.095	.490	.440	3.160	3.67	4	**.021***
Pair 8	Running away from peers - running away from peers	1.889	1.616	.539	.647	3.131	3.51	8	**.008***
Pair 9	Biting others - biting others	.600	1.342	.600	-1.066	2.266	1.00	4	.374
Pair 10	Expulsion from peer expulsion from peer related activities	2.294	.985	.239	1.788	2.801	9.60	16	**.000***
Pair 11	Showing excessive fear - showing excessive fear	2.250	1.125	.281	1.650	2.850	7.99	15	**.000***
Pair 12	Shyness- shyness	2.222	1.060	.250	1.695	2.749	8.89	17	**.000***
Pair 13	Physical activities physical activity skill deficit	2.000	.950	.168	1.657	2.343	11.9	31	**.000***
Pair 14	Hyperactive - hyper active	3.357	.497	.133	3.070	3.644	25.3	13	**.000***

NB: * indicate significant t-values. Paired t-test was done at a significant at $P \leq 0.05$.
Teachers rated the learners' behaviour on a scale of 1 – 5 (1-not at all, 2-Rarely, 3- sometimes, 4-often, 5-most of the times).

A paired sample t-test was also used to determine whether there was a statistically significant mean difference between pre-test and post-test of teachers rating learners with SID psychosocial behaviours in child to child physical activity programmes as indicated in table 4.15. The confidence interval of the difference, the t-value and the degree of freedom were also determined to show whether there was any significant difference in teachers rating of the learners with SID psychosocial behaviours before and after.

At the end of child to child programme, a significantly ($P < 0.05$) better rating was recorded in learners' behaviour of; withdrawal, t = 7.00, df=7 and 2-tail sig 0.000; temper tantrum, t = 3.67, df=4, 2-tail sig 0.021; running away from peers, t = 3.51,df=8,2-tail sig 0.008; expulsion from peer-related activities, t = 9.60, df=4, 2-tail sig 0.000; showing excessive fear, t=7.99, df=15, 2 tail sig 0.000; shyness, t = 8.89, df=17, 2tail sig 0.000; physical activities skill deficit, t = 11.9, df=31, 2 tail sig 0.000 and Hyperactive, t = 25.3, df=13, 2 tail sig 0.000.The findings indicated there was a significant change in most of the psychosocial behaviours among learners with severe intellectual disabilities. Most behaviour decreased to a meaningful degree of change. This proved that physical activities caused the change. The findings of the current study concur with Gast and Ledford (2014) study on a multiple probe across the behaviour of physical inactivity that at the end of the PA programme there was increased physical activity level. The same increase was evident in Adams et al. (2018) that high rates of challenging behaviours showed a drastic reduction. Alison et al. (2014) also opine challenging behaviour improvement and suggested the use of direct measurement of clients' behaviour in future.

4.5.6 Teachers Responses on Social Interaction Improvement for Learners with Severe ID at Mid-test of Organised Child to Child PA Programme

At mid-test and end-test (post-test) teachers also rated social interaction improvement of learners with severe intellectual disabilities during the child to child physical activities programme from that of a pre-test. Descriptive statistics were used to determine the improvement extent in frequencies and percentages as shown in tables 4.16 and 4.17.

Table 4.16: Teachers responses on social interaction improvement for learners with severe ID at mid-test of organised child to child programme

Response to Instructions	No improvement (%)	Little improvement (%)	Moderate improvement (%)	A lot of improvement (%)	So much improvement (%)
Sociability	6 (16.)	10 (27.8)	18 (50.0)	1 (2.8)	
Activity persistence	10 (27.8)	9 (25.0)	16 (44.4)	-	-
Distractibility	13 (36.1)	12 (33.3)	8 (22.2)	-	-
Emotional reactions	10 (27.8)	12 (33.3)	11 (30.6)	-	-
Self-driven physical activeness	9 (25.0)	10 (27.8)	11 (30.6)	4 (11.1)	-

In table 4.16, social interaction improvement analysis for learners with severe ID revealed that 11.1% of teachers noted a lot of improvement in self-driven physical activeness of the learners and 2.8% in sociability. Moderate improvement was noted by 50.0% of the teachers in sociability while 44.4% of the teachers noted moderate improvement in activity persistence. Little improvement was recorded by 33.3% of the teachers in emotional reactions and distractibility of the learners. At mid-test learners, mutual socialization was still developing the reason not much change was realized. However, more than half of the learners were socializing moderately.

4.5.7 Teachers Responses on Social Interaction Improvement at the End of the child to child PA Programmes

Table 4.17: Teachers response on social interaction improvement for learners with severe ID at the end of child to child PA Programme

Response to instructions	**No improvement** (%)	**Little improvement** (%)	**Moderate improvement** (%)	**A lot of improvement** (%)	**So much improvement** (%)
Sociability	2 (5.6)	4 (11.1)	10 (27.8)	17 (47.2)	2 (5.6)
Activity persistence	1 (2.8)	9 (25.0)	9 (25.0)	15 (41.7)	1 (2.8)
Distractibility	2 (5.6)	12 (33.3)	11 (30.6)	7 (19.4)	1 (2.8)
Emotional reactions	2 (5.6)	8 (22.2)	12 (33.3)	11 (30.6)	-
Self-driven physical activeness	2 (5.6)	8 (22.2)	9 (25.0)	11 (30.6)	5 (13.9)

Table 4.17 reflect that, at the end of the child to child physical activity programme, some learners with SID had shown some improvement in social interaction areas. There was a lot of improvement in sociability (47.2%), activity persistence (41.7%), emotional reactions (30.6%), self-driven physical activities (30.6%) and so much improvement (13.9%) was noted on the same. The findings indicated that self-driven physical activeness improved so much. This was an indication that regular child to child physical activity made an impact on motivating learners with severe intellectual disabilities to be self-driven in PA. Learners with severe intellectual disabilities with distractibility did not improve to the expectation same as activity persistent. This led the researcher to conceptualize that due to distractibility behaviour learners were not able to persist when performing PA activities. These findings agree with Kelso's (2014) that involving learners in PA helps them to learn how to co-operate with others.

The findings of this study further concurred with Adams et al. (2018) study that associated service use and access in young children with an intellectual disability or global developmental delay with challenging behaviours. The results were that maternal mental health was not associated with services accessed. There was no difference noted for self-injuries behaviour. The conclusion was that topography of challenging behaviour impacts the frequency and/or duration of community-based health care accessed. This is the reason physical activity frequency is crucial for the management of these individuals' psychosocial behaviours. The more the service is made available the less the psychosocial behaviours exhibited; hence, health well-being. These results, however, revealed four components which are important in interactions: sensitive responsiveness, joint attention, co-regulation and an emotional component.

The abilities and disabilities, interactive behaviours and personality of persons with severe ID influences are the partners' interactive strategies, knowledge and perceptions and the context of the interaction (Adams et al., 2018). According to their conclusion, such a model integrates the results and forms a vehicle to facilitate our understanding of interactions with persons with high support needs. This supports the reason as to why the current study paired learners with and without intellectual disabilities. Adams et al. (2018) study paired and grouped them according to their social relations at home and school. For that matter, their research paired and grouped learners who are short-tempered (temper tantrum throwers) with those who are tolerant. The current study paired learners with and without severe intellectual disabilities together. The later were only cautioned on how to relate to those with severe intellectual disabilities exhibiting psychosocial behaviours.

Further findings over a cross-sectional study on several studies were that all informants in their study commented on the improved interpersonal skills (McConkey et al., 2012). This geared towards self-belief and self-esteem which leads to self-driven activity persistence. The studies also noted improvements in confidence and self-esteem among other sociability skills (McConkey et al., 2012) similar to the current study.

4.6 Effects of Child to Child Physical Activity on Physical Activity Levels of Learners with and without Severe Intellectual Disabilities before and after Organized Child to Child Physical Activity Programmes

Learners sampled in this research were those with SID and those without SID from each of the different schools. From each school, four children without and four children with SID were sampled. The children pre-test, mid-test and post-test PA in a pedometer step count table in 25 and 50 metres dash were established. A simple linear regression analysis was done to determine the null hypothesis at $P \leq 0.05$ which addressed objective four of the study.

4.6.1 Testing of Hypothesis 2

Ho2. There will be no significant relationship between regular child to child physical activity and physical activity level of learners with and without intellectual disabilities in primary schools in selected counties in Kenya.

The hypothesis sought to determine if there was any significant relationship between regular child to child physical activity and physical activity level of learners with and without severe intellectual disabilities. Therefore, learners with and without intellectual disabilities step counts and scores were taken at pre-test, mid-test and at

post-test of child to child physical activities practice. Two sample t-tests statistics were used to analyse the data as indicated in tables 4.17, 4.18, 4.19, 4.20, 4.21 and 4.22. The findings reflected significant differences in the performance of PA between both learners with and without severe intellectual disabilities. Similarly, there was a significant relationship between their regular physical activities and their level of physical activity as indicated in figures 4.3, 4.4, 4.5, 4.6, 4.7 and 4.8 compared in the three levels (pre-test, mid-test and post-test). The significance difference noticed when comparing the two groups of learners with and without severe ID indicates that those without severe ID performed better than those with severe intellectual disabilities. The linear regression of a straight line in each group's performance compared at pre-test, mid-test and post-test indicate a significant relationship (continuous linear regression) between the regular child to child physical activity and the physical activity level of both learners with and without intellectual disabilities. Therefore, the second null- hypothesis that there was no significant relationship between regular child to child physical activity and physical activity level of learners with and without intellectual disabilities was rejected.

4.6.2 Learners' with and without Severe ID Gross Motor (Pedometer step Count in 25 metres dash) Skill Performance

Table 4.18: Learners with and without SID step counts in 25 metres dash

	Pre-test (Mean±SE)	**Mid-test (Mean±SE)**	**Post-test (Mean±SE)**
Children with SID	37.51 ± 2.04b	34.26 ± 2.21b	31.03 ± 2.36b
Children without ID	19.31 ± 0.99a	16.31± 0.84a	12.97 ± 0.72a
T –value	8.02	7.59	7.33
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two sample T-test at $P \leq 0.05$

In table 4.18 the mean step count showed a significant difference for both learners with and without severe intellectual disabilities. The mean for those with SID showed a significant difference basing on the mean, standard error value and the hypothesis testing (P=0.0001) of 31.03 ± 2.36b at post-test from 37.51 ± 2.04b at pre-test. Similarly, those without SID had a significant difference mean of 12.97 ± 0.72a at post-test from 19.31 ± 0.99a at pre-test. The study also wished to determine whether there was a significant relationship between regular physical activity practice and the physical activity level of both learners with and without SID. This was indicated from pre-test to mid-test to post-test by a simple linear regression. A simple linear regression computation of R^2 was done as in figures 4.3 to 4.8. Simple linear regression is a sub-section of Pearson correlation coefficient computation that determines a linear relationship between two variables. By linear relationship, we mean that the relationship can be well characterized by a straight line (Kennedy, 2005).

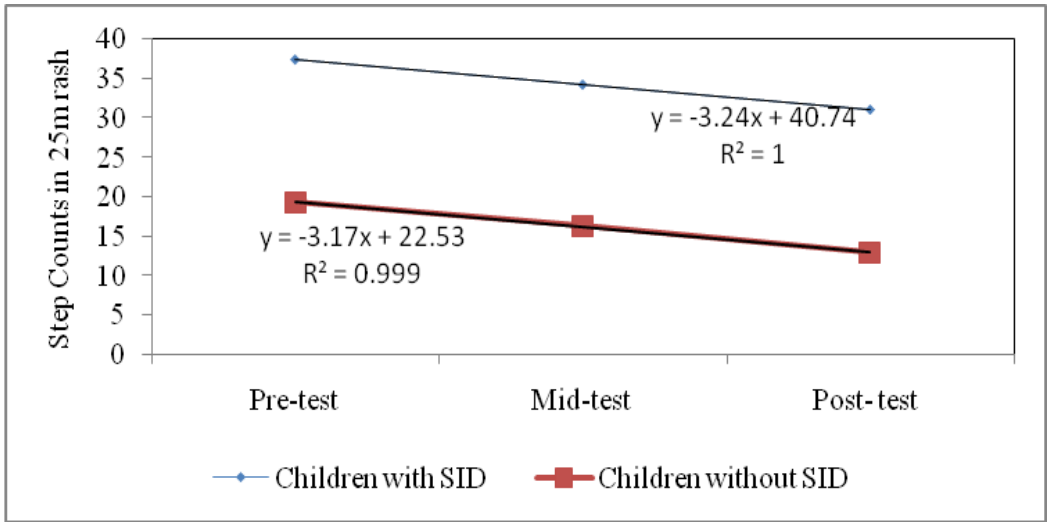


Figure 4.3: Change in step counts in the pre-test, mid-test and post-test in 25M dash (R2=1) where higher scores on X are associated with lower scores on Y

Figure 4.3 show the learners change in the number of steps from the pre-test, mid-test and the post-test counts at the end of the programme for both learners with and without SID. Change in the number of steps of learners with SID adopted a model of $Y = \beta_1 x_1 + \text{constant}$ where Y = the change in steps, β = is the beta coefficient, X_1 = change in step (pre, mid, post-test). This was therefore established to show a regression R^2 value of 1.00 for the children with SID and R^2 value of 0.999 for those without SID which adopted the regression models of; Y = -3.24x + 40.74 for children with SID while for the without SID were Y = -3.17x + 22.53. The regression in 25-metre dash of the learners showed that there was a significant relationship in the learners' regular physical activities and regular activity levels at pre-test, mid-test and post-test for both learners with and without ID.

4.6.3 Learners' with and without Severe ID Gross Motor (pedometer step count in 50 metres dash) Performance

Table 4.19: Learners with and without SID step counts in 50 metres dash

	Pre-test (Mean±SE)	Mid-test (Mean±SE)	Post-test (Mean±SE)
Children with SID	71.83 ±2.42b	63.20 ±3.20b	55.68 ± 3.48b
Children without SID	32.47 ±2.11a	27.59 ± 1.57a	20.70 ±1.19a
T –value	12.28	9.99	9.50
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two sample T-test at $P \leq 0.05$

The mean in step counts showed a significant step count reduction of 55.68 ± 3.48b at post-test from 71.83 ±2.42b at pre-test for learners with SID. Those without SID similarly showed a step count mean reduction of 20.70 ±1.19a at post-test from 32.47 ±2.11a at pre-test as shown in table 4.19. In a 50 metres dash, the step count of the learners showed that there was a significant difference in the number of steps

made by learners with intellectual disability from the ones made by those without severe intellectual disability. Learners without severe intellectual disability made fewer steps at the pre-test, mid-test and post-test than learners with intellectual disability as shown in table 4.19. The findings from this study are very similar to others where step counts were established from baseline-test to post-test. Adams et al. (2018) note high success rates for their participants with severe to profound intellectual disabilities where they involved adapted physical education teacher to conduct the research. In the current study, PE teachers were also involved since they were conversant with activities suitable for learners with severe intellectual disabilities.

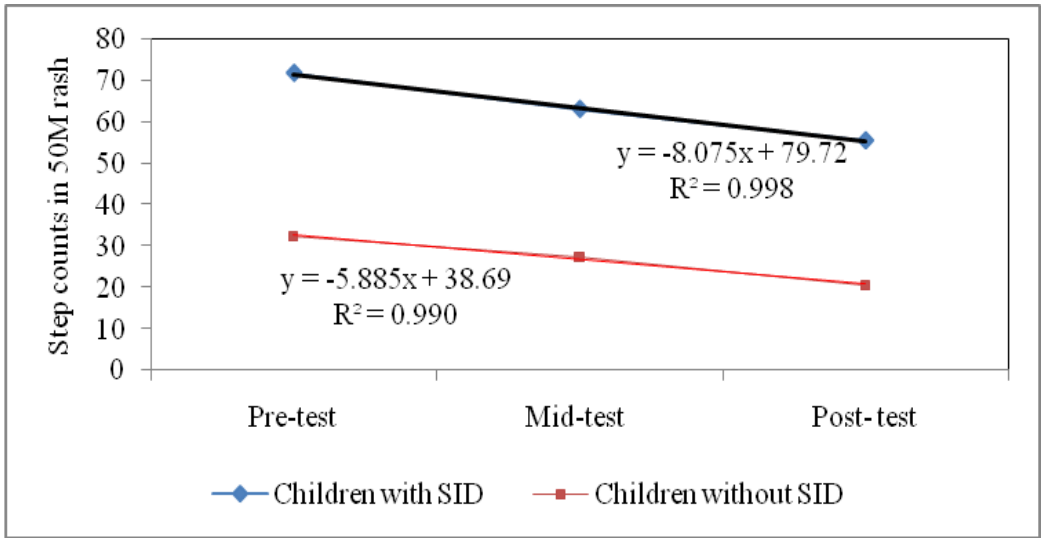


Figure 4.4: Change in step counts in the pre-test, mid-test and post-test in 50M dash (R2=1) where higher scores on X are associated with lower scores on Y

Figure 4.4 indicate a change in the number of steps from the pre-test, mid-test and the post-test counts at the end of the programme for both learners with and without SID. Change in the number of steps of learners with SID adopted a model of $Y = \beta_1 x_1 + \text{constant}$ where Y = the change in steps, β = is the beta coefficient, X_1 =

change in step (pre, mid, post-test). This was therefore established to show a regression R^2 value of 0.998 for the learners with SID and R^2 value of 0.990 for those without SID which adopted the regression models of; Y = -5.885x + 38.69 for learners with SID while for those without SID were Y = -8.075x + 79.72. The linear regression in 50-metre dash of the learners showed that there was a significant relationship in the learners' regular physical activity and physical activity levels at pre-test, mid-test and post-test. The straight-line regression for both learners with and without SID was noted. This indicated that learners' physical activity level increased with the more regular physical activity practice as shown in plates 4.2.

Plates 4.2: Learners running 25 and 50 meters dash in different fields

Plate 4: The research assistant removes a pedometer for step count reading

Plate 5: Partners running as the PE teacher and other children motivates through shearing.

Plate 6: Learner with SID assisted walking by partner

Plate 7a: Failure to follow instructions

Plate 7b:well run guided by the string

4.6.4 Learners with and without Severe ID Gross Motor (Standing Long Jump) Skill Performance

Table 4.20: Learners with and without severe ID gross motor (standing long jump) skill performance

	Pre-test (Mean±SE)	Mid-test (Mean±SE)	Post-test (Mean±SE)
Children with SID	0.32 ± 0.027 a	0.34 ±0.029a	0.41 ± 0.031a
Children without ID	1.23 ± 0.027b	1.27 ± 0.031b	1.34 ± 0.031b
T –value	23.85	21.62	21.44
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two sample T-test at P ≤0.05

Table 4.20 showed that there was a significant difference in the distance jumped by learners with severe intellectual disability from that made by learners without severe intellectual disability (P = 0.0001) at pre-test, mid-test and post-test. Learners without severe intellectual disability made significant longer distances at pre-test, mid-test and post-test than learners with severe intellectual disability. The results at pre-test showed a mean difference and standard error of 0.32 ± 0.027a, 0.34 ±0.029a at a mid-test and 0.41 ± 0.031a at the end of the child to child PA programme for learners with severe intellectual disabilities. On the other hand, those without severe intellectual disabilities showed a mean of 1.23 ±0.027b at pre-test, 1.27 ± 0.031b at mid-test and 1.34 ± 0.031b at the end of the PA programme respectively. The results showed a significant statistical difference of T= 23.85 at pre-test, T= 21.62 at mid-test and T=21.44 at post-test and the P-values of 0.0001 at the end(post-test) of the organized PA programme.

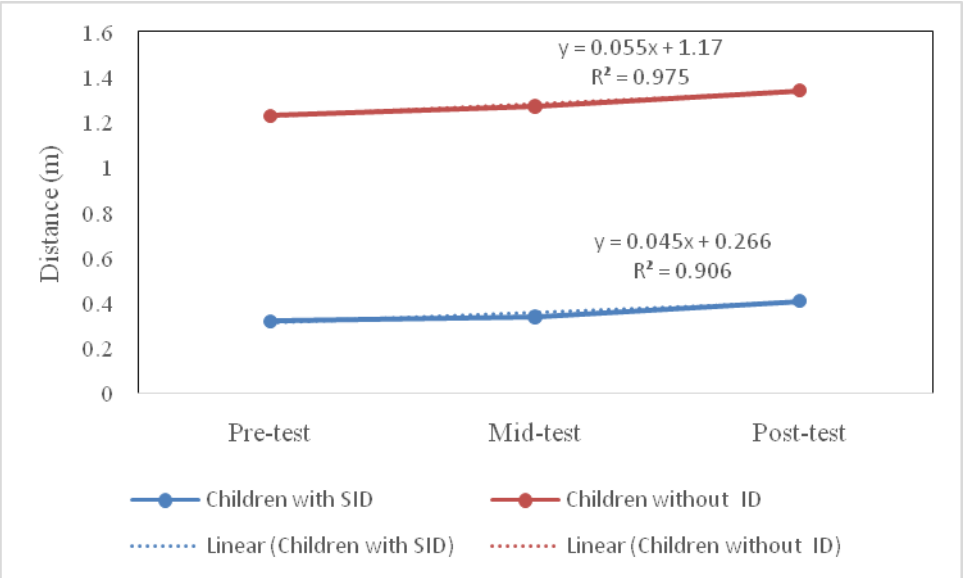


Figure: 4.5: Change in Standing Long Jump in the pre-test, mid-test and post-test in the long jump

Figure 4.5 show the change in the standing long jump distance from the pre-test, mid-test and the post-test at the end of the PA programme for both learners with SID and those without SID. Change in the distance made by learners with SID adopted a model of $Y = \beta_1 x_1 +$ constant where Y = the change in distance, β = is the beta coefficient, X_1 = change in distance (pre, mid, post-test). This was therefore established to show a regression R^2 value of 0.906 for the children with SID and R^2 value of 0.975 for those without SID which adopted the regression models of; Y = -0.045x + 0.266 for the children with SID while for those without SID were Y = 0.055x + 1.17. However, in both cases, there was a straight-line linear regression denoting a gradual continuous change in standing long jump performance. It was then definite that there was a significant relationship between regular physical activities and the physical activity levels of both learners with and without SID. This showed that in both cases, learners were weak in performance in the standing long

jump. The current study therefore, calls for more practice of the same skill. The skill seemed to be difficult; however, those without severe intellectual disabilities were able to reach the maximum and extended beyond the measure of the 1 metres rule for the severe learners with intellectual disabilities as stipulated by the special Olympic Games in Kenya.

Similar findings on standing long-jump were given in Italy by Guidetti et al. (2010) by use of descriptive statistics, where 3% of those involved in the study were those with severe ID. The study tested the standing long jump with 38% mild disabilities, 22% moderate, 38% difficult and 3% extreme (severe). The findings indicated that those with severe intellectual disabilities happened to be involved less than the other two severities (mild and moderate).

Other findings also reported by Guidetti et al. (2010) indicate that learners with severe intellectual disabilities show a low level of physical activeness compared to those without intellectual disabilities. The study used one of its tests as a step-test. It was found out that the lower the level of disability, the higher the achievements in motor coordination. Therefore, those with severe intellectual disability performed less compared to their peers with mild and moderate intellectual disabilities a similar case to the current study.

Moreover, Ming Yang-Chul-Hyeong Park et al. (2018) noted that participants took on average 6,677+2,600 steps per day, with the intensity of 1,040+431 counts per minute. Low motor development was associated with low physical activity. More than half of the participants were not meeting the recommendations of their physical activeness. Also, Marieke et al. (2018) establish that physical activity behaviour

measured with accelerometers showed that children and adolescents with intellectual disability were less active than the typically developing children (Einarsson, Johanns et al., 2016). The current study realized used a different objective physical activity measure (Pedometer). The previous objective measure used an accelerometer which is more appropriate than the later (pedometer) but had a cost implication that the researcher was unable to meet; hence, the choice of a simple gadget. These devices translate movement in the direction of three internal axes into counts. They have been validated on the children with intellectual disabilities (McGarty et al., 2016). They are supposed to be worn continuously on several consecutive days during the physical activity which was adopted by the current study.

Promoting sport/exercise and physical activity in children and young people with intellectual disability may play a role in helping to reduce the health inequalities experienced by people with intellectual disabilities including those with severe conditions. Boer et al. (2014) noted that exercise demonstrates a reduction in fat percentage among learners with intellectual disabilities including those with severe conditions of the same disability. Fat adiposity is one of the global threats to the heart health in a human being. Leung et al. (2017) agrees with the current study that little is known on the habitual physical activity levels of children and adolescents with more severe levels of intellectual disability. Furthermore, majority of the previous studies were conducted among children and adolescent with mild to moderate intellectual disability.

Westendrop et al. (2011) results on the correlation between motor abilities and participation in organized sports activities among learners with mild intellectual disabilities (N=156, 104M, 52F) between the ages 7 and 12 and children with

normal development (N=255, 138M, 117F). The same age bracket had similar physical activities skills with the current study. Children with intellectual disabilities were found to score significantly lower than their typically developing peers in that study. The ones with high scores were reported to have more organized sports activities. It was also noticed that participation in sports activities improved the motor skills of learners with mild intellectual disabilities. Object control skills such as throwing and catching were observed to have progressed greatly. Children with mild intellectual disability that regularly took part in more organized sports activities proved to have high scores. Nonetheless, they had lower scores in loco-motor measures such as running and jumping. A case of LWSID was yet to be established. The former findings was supported by the current where running 25 metres, 50 metres dash and standing long jump gross motor activities by children with severe intellectual disabilities in organized child to child physical activities was practised. The gross-motor skills performance had lower scores similar to Westendrop et al. (2011).

The American Guidelines Report for Physical Activity (Piercy et al., 2018) emphasizes that participation in physical activity in a community setting with others, such as friends and family, can increase physical activity levels. The report establishes that adults are more likely to participate in physical activity when they are supported by others at specified levels of physical activity. While this was similar to the exercise carried out in the current study, only learners with and without severe disabilities were paired in the child to child physical activity programmes.

Further, the current study findings are in line with Bechar and Grosu (2016) that persons with intellectual disabilities are often characterized by having more difficulties and limitations in the performance of sports skills; hence, physical inactivity. The research highlighted that these difficulties may influence social or emotional areas of functioning as well as cognition. They further emphasize that work in the motor field serves both as a therapeutic and rehabilitative tool for each functioning domain. In the current study, the two domains included both gross and sensory motor activities. These physical activities served as therapeutic to psychosocial behaviours exhibited by learners with severe intellectual disability in the current study and were practised as reflected in plates 4.3.

Plates 4.3: Children performing standing long jump activities in different fields

Plate 8: A learner without ID perform standing long jump

Plate 9: A learner with SID perform standing long jump

Plate 10: A learner with SID assisted to position the legs for a standing long jump

Plate 11: Leaner without ID perform standing long jump

Plate 12: A research assistant demonstrate standing long jump to a learner with SID

4.6.5 Learners Sensory Motor (walking along obstacle, softball throw and tennis ball catch) Skill Performance

In this study, physical activities included sensory motor exercises. The exercises were individualized to each participant with severe intellectual disability paired with peer participant without SID. Each activity was conducted by the researcher, the research assistant and the physical education teacher. The exercises were allocated 10-15 minutes per physical activity and they were conducted in the morning hours. There were some instances where participants with severe intellectual disabilities

refused to participate. In such an instance, the morning schedule was rescheduled in the afternoon to give such a child a chance to participate. However, this was observed in two schools only (one in Kiambu and another in Murang'a). Their refusal to participate was as a result of temper tantrum psychosocial behaviour. This is because at other times they participated wilfully. This had to be dwelt with patiently as it was especially during cold morning hours the reason it was rescheduled to the afternoon. The physical activities performances are presented in tables 4.21, 4.22, and 4.23 respectively.

4.6.6 Learners with and without Intellectual Disability Sensory Motor (Walking along Obstacles) Performance

Table 4.21: Learners with and without severe intellectual disability walking along obstacles

	Pre-test (Mean±SE)	**Mid-test (Mean±SE)**	**Post-test (Mean±SE)**
Children with SID	2.39 ± 0.266a	3.22 ± 0.321a	4.10 ± 0.351a
Children without ID	9.61 ± 0.089b	9.87 ± 0.046b	9.93 ± 0.029b
T –value	25.77	20.49	16.53
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two sample t-test at $P \leq 0.05$

In walking along obstacles, the results in table 4.21 showed that there was a significant difference in the number of obstacles knocked down by learners with severe intellectual disabilities from those knocked down by learners without severe intellectual disability ($P = 0.0001$). Learners without severe intellectual disability walked along the obstacles knocking down very few of them at pre-test, mid-test and

post-test, while learners with severe intellectual disabilities knocked down many obstacles. Each obstacle knocked down was counted as a score missed while that not knocked down was counted as the learners' attained score. The result at pre-test showed a mean difference and a standard error of 2.39 ± 0.266a at pre-test, 3.22 ± 0.321a at mid-test and 4.10 ± 0.351a at the end of the child to child PA programme for learners with severe intellectual disabilities. Conversely, those without intellectual disabilities showed a mean difference and a standard error of 9.61 ± 0.089b at pre-test, 9.87 ± 0.046b at mid-test and 9.93 ± 0.029b at the end of the PA programme respectively. The results showed a significant difference of T= 25.77at pre-test, T= 20.49 at mid-test and T=16.53 and P values of 0.0001 at post-test of the organized PA programme. The conception of the findings is that learners without severe intellectual disability performed better than learners with severe intellectual disabilities. Their perception is more developed than of the later that experience poor perceptual skills hence knocked down most of the obstacles.

To ascertain the relationship between regular physical activities and the children's physical activity levels at pre-test, mid-test and post-test a linear regression computation was done and the results were as in figure 4.6.

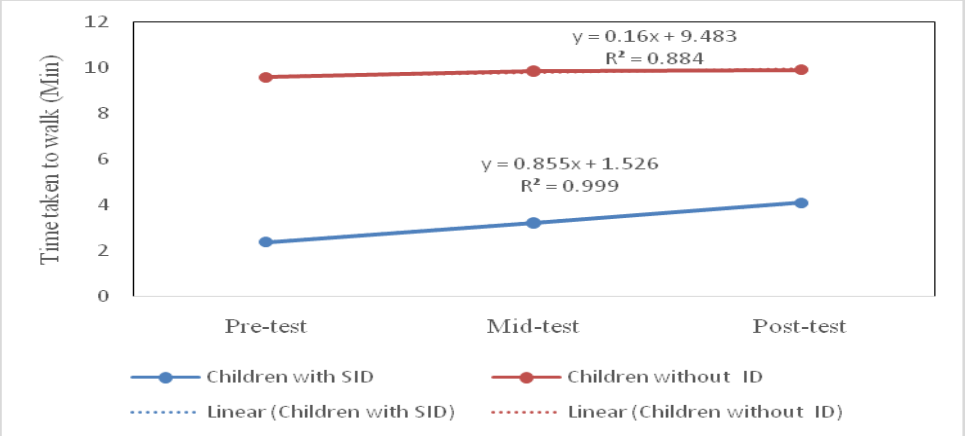


Figure 4.6: Change in the number of walking along obstacles in the pre-test, mid-test and post-test (R2=1)where higher scores on X are associated with higher scores on Y

Figure 4.6 reflect a change in the scoring of walking along obstacles by learners from pre-test, mid-test and the post-test for both learners with and without SID. Change in the score made by learners with SID adopted a model of $Y = \beta_1 x_1 +$ constant where Y = the change in the score, β = is the beta coefficient, X_1 = change in score (pre, mid, post-test). This was therefore established to show a regression R^2 value of 0.999 for the learners with SID and R^2 value of 0.884 for those without SID which adopted the regression models of; Y = 0.885x + 1.526 for learners with SID while for the without SID were Y =0.16 x +9.483. This showed there was a significant relationship of a straight-line linear regression for both learners with and without ID. The ground performances were as shown in plates 4.4.

Plates 4.4: Learners performing walking along obstacles in different fields

Plate 13: A learner with SID starting walking along obstacles without assistance

Plate 14: An improved learner with SID guides another with SID walk along obstacle after the PA programme.

Plate 15: a learner with SID walk along obstacles as the partner without SID and the research assistant observes prompting her verbally

4.6.7 Sensory Motor (Soft Ball Throws) Performance

Table 4.22: Learners softball throws

	Pre-test (Mean±SE)	Mid-test (Mean±SE)	Post-test (Mean±SE)
Children with SID	3.07 ± 0.325a	3.40 ± 0.321a	3.78 ± 0.348a
Children without SID	12.95 ± 0.375b	14.23 ± 0.431b	16.27 ± 0.515b
T –value	19.91	20.15	20.09
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two sample T-test at P ≤0.05

Softball throws by the learners with SID and those without SID were significantly different (P = 0.0001) in table 4.22. Learners without severe intellectual disability made far throws of softballs at the pre-test, mid-test and post-test than learners with severe intellectual disabilities. The mean differences and the standard error for children with SID were 3.07 ± 0.325a at pre-test, 3.40 ± 0.321a mid-tests and 3.78 ± 0.348a at post-test. It was definite that at post-test the mean was significantly higher than at pre-test and mid-test. This meant a greater improvement made by learners with severe intellectual disability. Similarly, those without SID had mean differences and the standard error of 12.95 ± 0.375b at pre-test, 14.23 ± 0.431b at mid-test and 16.27 ± 0.515b at post-test. The results showed a significant difference of T= 19.91at pre-test, T= 20.15 at mid-test and T=20.09 at the end of the organized PA programme. Learners without severe intellectual disabilities seemed to improve more than those with severe intellectual disabilities. Their performance could be so since they did not have challenging motor difficulties as those with severe intellectual disabilities.

To determine the relationship between the regular physical activity and the physical activity level of both learners with and without SID a simple linear regression correlation was done as indicated in figure 4.7.

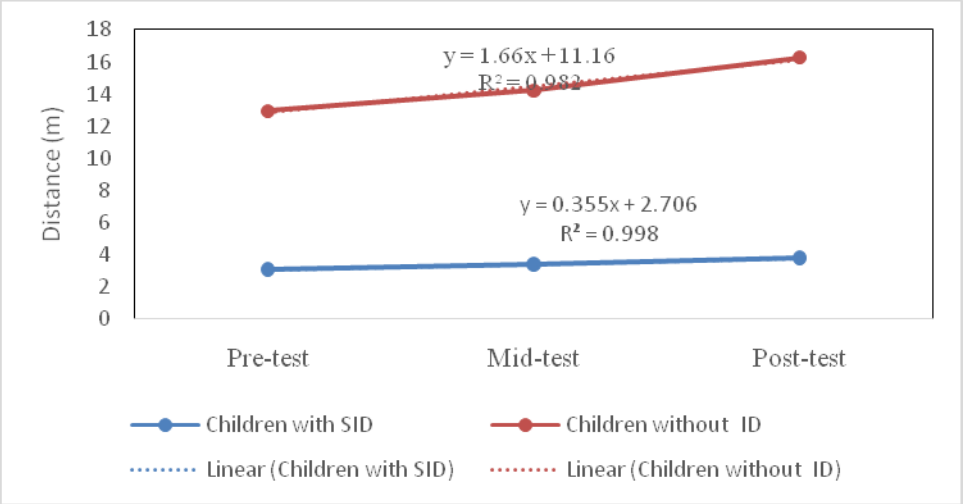


Figure 4.7: Change in distance in softball throws in the pre-test, mid-test and post-test (R2=1) where longer distance on X are associated with long distance on Y

Figure 4.7 show change in the distance of softball throws by learners in the pre-test, mid-test and post-test at the end of the programme for both learners with and without SID. Change in the distance made by learners with SID adopted a model of $Y = \beta_1 x_1 +$ constant where Y = the change in distance, β = is the beta coefficient, X_1 = change in distance (pre, mid, post-test). This was therefore established to show a regression R^2 value of 0.998 for the learners with SID and R^2 value of 0.982 for those without SID which adopted the regression models of; Y = 0.3555x + 2.706 for learners with SID while for the without SID were Y =1.66 x +11.16. This showed a significant relationship between regular physical activities and the children's physical activity levels at pre-test, mid-test and post-test of the child to child PA

programme. This was evidenced by a study that was carried out by Westendrop et al. (2011) which compared an age group of between ages 7 and 12 with a large population of 156 (mild ID) and 255 (without ID). Participants improved their motor skills and progressed more in object control skills such as throwing. This was also observed in both learners with and without severe intellectual disabilities in the current study. Those without SID showed more improvement in the skills than those with severe intellectual disabilities. This is supported by Bechar and Grosu (2016) that persons with intellectual disabilities are often characterized by having motor difficulties and this limitation is expressed in the performance of physical activity skills. The researchers further note that these difficulties may influence a person's social or emotional areas of functioning. However, the above researches worked with learners with intellectual disabilities that were mildly affected thus making them differ from the current study that looked at those that had severe intellectual disabilities.

On the same skill Adam et al. (2019**)** did a Seated medicine Ball throw which they termed low-risk, easy to perform, requires minimal equipment and is a valid measure of upper body explosiveness (3 consecutive trails were within 0.25m - 3.85 + before 1.114m/s - 3.92 m/s after). The current study supports the above Adam et al. (2019) in that even in a seated position physical activity can still make an impact on the upper body of an individual who is limited in gross motor movements. Hence, improved physical activities. In the current study, some learners with severe intellectual disabilities were supported to walk 10 metres of physical activity and as such, they threw the softball while seated. It is then evident that despite the severity of the disability, there are physical activity skills appropriate for such categories of

learners with severe disabilities. A few of such skills were practised in the current study as exhibited in plates 4.5.

Plates 4.5: Learners perform softball throw in different fields

Plate 16 a: A learner with SID before (stares) Plate 16b: Improved same learner with SID after

Plate 17: A learner with SID being verbal motivated by both the research assistant and the Partner without SID to throw the softball

Plate 18: A learner with SID still under instruction on the softball throwing but just walks towards the research assistant instead of throwing the ball.

4.6.8 Learners with and without SID Sensory Motor (Tennis Ball Catch) Performance

Table 4.23: Learners Tennis ball catch

	Pre-test (Mean±SE)	**Mid-test (Mean±SE)**	**Post-test (Mean±SE)**
Learners with SID	0.70 ± 0.116a	1.421 ± 0.158a	1.766 ± 0.184a
Learners without SID	4.731 ± 0.057b	4.88 ± 0.037b	4.91± 0.028b
T –value	31.22	21.32	16.93
P – value	0.0001	0.0001	0.0001

Mean values in the same column denoted by different letters are significantly different. Two samples T-test at P ≤0.05 was done.

In a tennis ball catch, the results in table 4.23 showed that there was a significant difference in the ability to catch tennis ball short between learners with and without severe intellectual disabilities. Learners without severe intellectual disabilities were able to catch tennis balls better at the post-test, pre-test and mid-test than learners with severe intellectual disabilities. At pre-test the mean result for those with severe intellectual disabilities was 0.70 ± 0.116a at pre-test, 1.421 ± 0.158a at mid-test and 1.766 ± 0.184a at post-test. The tennis ball catch by the learners without severe

intellectual disabilities was significantly different from the tennis ball catch of learners with severe intellectual disabilities at all levels of performance. At pre-test the mean and the standard error were 4.731 ± 0.057b, 4.88 ± 0.037b at mid-test and 4.91± 0.028b at the end of the child to child organized physical activities. The results similarly showed a significant difference of T= 31.22 at pre-test, T= 21.32 at mid-test and T=16.93 and P values of 0.0001 at the end(post-test) of the child to child PA programme. The relationship between the regular physical activities and the physical activity level of both learners with and without SID was determined by computing a simple linear regression correlation coefficient as indicated in figure 4.8.

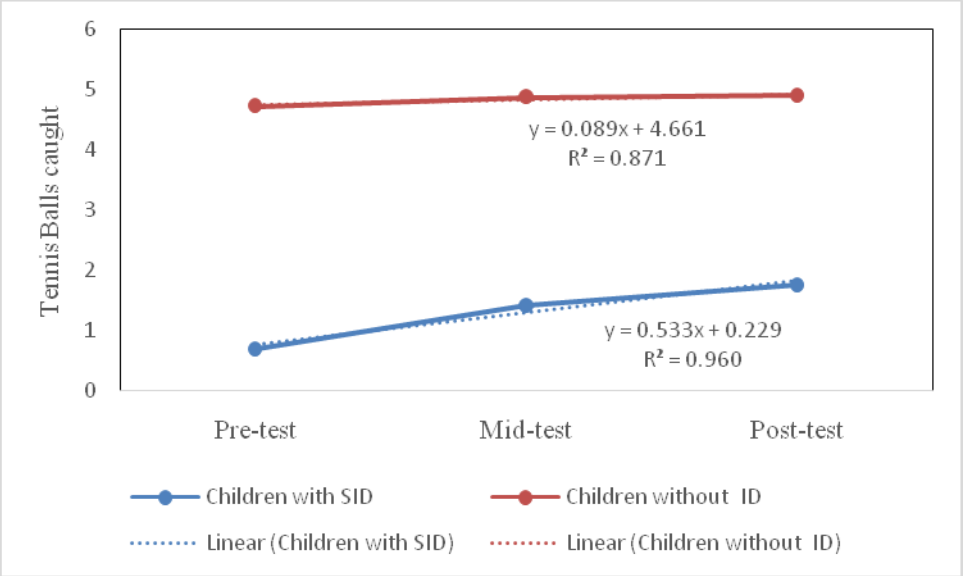


Figure 4.8: Change in the number of tennis balls caught in the pre-test, mid-test and post-test (R2=1)where higher scores on X are associated with higher scores on Y

Figure 4.8 show change in the number of Tennis balls caught by learners at the pre-test, mid-test and the post-test at the end of the programme for both learners with

and without SID. Change in the score made by learners with SID adopted a model of $Y = \beta_1 x_1 +$ constant where Y = the change in the score, β = is the beta coefficient, X_1 = change in score (pre, mid, post-test). This was therefore established to show a regression R^2 value of 0.960 for the learners with SID and R^2 value of 0.871 for those without SID which adopted the regression models of; $Y = 0.533x + 0.229$ for learners with SID while for the without SID were $Y = 0.895x + 4.661$. The straight-line linear regression indicated a significant relationship from pre-test to mid-test to post-test between the regular physical activity and the physical activity level of both learners with and without SID. It is clear that for both parties, the performance of the PA activity improved as the practice continued from pre-mid- and post stages. However, learners with a severe intellectual disability still lagged behind compared to the ones without the disability. The ground performances were as shown in plates 4.6.

Plate 4.6: Learners performing Tennis ball catch in different fields

Plate 19: A learner with SID receiving a tennis ball after much practice

Plate 20: A learner with SID misses a tennis ball catch during the PA session

Plate21: A learner with SID misses a tennis ball catch due to in attention behaviour

4.7 Teachers Rating Gross and Sensory Motor Skills Performance of Learners with Severe Intellectual Disabilities before and after the Organized Child to Child Physical Activity Programmes

The study objective five sought to compare gross and sensory motor skills performance of learners with severe intellectual disabilities before and after child to child PA programme. Descriptive statistics and inferential statistics were used to analyse 5 points Likert scale (very weak, weak, average, strong and very strong). The analyses were rated by teachers only. Reports were given in frequencies and

percentages as in table 4.23, 4.24 and 4.25. Inferential statistics employed to test hypothesis three were as indicated in table 4.26.

4.7.1 Teachers Rating Gross and Sensory Motor Skills Physical Activeness of Learners with Severe Intellectual Disabilities at the Beginning of the PA Programme

Table 4.24: Teachers rating of gross and sensory motor skills physical activeness of learners with severe intellectual disability at the beginning of the PA programme

Gross motor skills	Very weak (%)	Weak (%)	Average (%)	Strong (%)	Very strong (%)
Assisted walk 10, 25,50 metres	5 (13.9)	-	-	-	-
Running 10, 25, 50 metres dash	30 (83.3)	4 (11.1)	1 (2.8)	-	-
Standing jump	30 (83.3)	4 (11.1)	2 (5.6)	-	-
Sensory motor					
Throwing soft ball	27 (75.0)	1 (2.8)	3 (8.3)	4 (11.1)	-
Walking along an obstacle path	27 (75.0)	1 (2.8)	3 (8.3)	4 (11.1)	-
Tennis ball catch	27 (75.0)	1 (2.8)	3 (8.3)	4 (11.1)	-

In table 4.24 the gross and skills performance for learners with severe intellectual disabilities at the beginning of the child to child PA programme were established. In gross motor activities skill performance learners with SID were very weak in standing long jump as was reported by 83.3% of the PE teachers. Still, 83.3% of teachers observed running of 25 and 50 metres dash being very weak. In Sensory motor activities throwing the softball, walking along obstacles and tennis ball catch was reported by 75% of teachers respectively. However, 11.1% of the PE teachers reported that some learners were strong in the three sensory motor activities even at

the beginning of child to child organized physical activity programmes. The findings reflected a very weak status of gross and sensory motor physical activities performance in most of the activities. This called for more practice at mid and post-test levels to determine the effect of regular physical activity on physical activity levels of both learners with and without severe intellectual disabilities. The current study findings are in line with Guidetti et al. (2010) who established effects of sports activities on physical fitness and health of young adults with intellectual disabilities (M=64, 38% mild disabilities, 22 moderate, 38 difficult and 3% extreme). However, their study involved a wider range (age 18-45 years) of young adults with intellectual disabilities looking at the three levels (mild, moderate and severe). Step tests in standing long jump, handgrip test, sit-ups and push-ups test were taken. The results showed higher grades of step counts in young adults with mild disabilities than other severity levels.

4.7.2 Teachers rating gross and sensory motor skills physical activeness of learners with severe intellectual disabilities at the mid-test of child to child N=36

Table 4.25: Teachers rating gross and sensory motor skills physical activeness of learners with severe intellectual disabilities at the mid-test of child to child PA Programme

Gross motor skills	Very weak (%)	Weak (%)	Average (%)	Strong (%)	Very strong (%)
Assisted walk 10, 25,50 metres	2 (5.6)	1 (2.8)	-	-	-
Running 10, 25, 50 metres dash	20 (55.6)	9 (25.0)	3 (8.3)		
Standing jump	15 (41.7)	8 (22.2)	6 (16.7)	1 (2.8%)	-
Sensory motor skills					
Throwing soft ball	15 (41.7)	8 (22.2)	5 (13.9)	-	1 (2.5)
Walking along an obstacle path	12 (33.3)	8 (22.2)	6 (16.7)	-	6 (16.7)
Tennis ball catch	11 (30.6)	5 (13.9)	7 (19.4)	8 (22.2)	1 (2.8)

Results at the mid-test of the child to child PA programme in table 4.25 indicated that 16.7% of the teachers realized that learners with severe intellectual disabilities were very strong in walking along obstacles, 2.8% were very strong in tennis ball catching whereas 2.8% were very strong in throwing the softball. One (2.8%) teacher noted that learners with severe intellectual disabilities were strong in standing long jump activities while 8.3% of the teachers indicated that learners exhibited an average measure in 10 metres assisted walking, 25 and/or 50 metres dash. The findings indicate an improvement of the PA performance in almost all the activities. However, walking along obstacles was the most improved activity

followed by tennis ball catch and throwing the softball. This was an indication that sensory motor skills were acquired by learners with severe intellectual disabilities than the gross motor ones. This could be as a result of their gross motor skills limitations especially where they had to use their lower limbs to run or walk. The area of gross motor therefore needs more concern of the PE teachers.

4.7.3 Teachers rating gross and sensory motor skills physical activeness of learners with severe intellectual disability at the end of child to child PA Programme

Table 4.26: Teachers rating gross and sensory motor skills physical activeness of learners with severe intellectual disability at the end of child to child PA Programme

Gross motor skills	Very weak (%)	Weak (%)	Average (%)	Strong (%)	Very strong (%)
Assisted walk 10, 25,50 metres	1 (2.8)	2 (5.6)	2 (5.6)	1 (2.8)	-
Running 10, 25, 50 metres dash	3 (8.3)	20 (55.6)	6 (16.7)	2 (5.6)	-
Standing jump	7 (19.4)	11 (30.6)	7 (19.4)	4 (11.1)	1 (2.8)
Sensory motor Skills					
Throwing soft ball	5 (13.9)	9 (25.0)	8 (22.2)	6 (16.7)	4 (11.1)
Walking along an obstacle path	8 (22.2)	4 (11.1)	8 (22.2)	5 (13.9)	7 (19.4)
Tennis ball catch	10 (27.8)	3 (8.3)	5 (13.9)	6 (16.7)	10 (27.8)

In table 4.26 at the end of the child to child PA programme, 27.8% of the teachers stated that learners with SID were very strong in catching a tennis ball, 19.4% stated

they were very strong in walking along obstacles, 11.1% noted that they were very strong in throwing the softball while 2.8% noted they were very strong in standing long jump. Learners with severe intellectual disabilities improved in tennis ball catch than any other activity. The second improved activity was walking along the obstacles followed by throwing the softball and finally the standing jump. The results reflected an improvement in all of the sensory motor activities with only one (standing jump) gross motor activity improving more reason to why practice in the area of the gross motor should be enhanced by teachers.

4.7.4 Comparison of the Learners with Severe Intellectual Disabilities Gross and Sensory Motor Physical Skills Activeness at the End to that at the Beginning of the Child to Child PA Programme

4.7.5 Testing of Hypothesis 3

H03. There is no significant difference in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after child to child PA programme in primary schools in selected counties in Kenya.

The third hypothesis sought to determine whether there was any significant difference in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after child to child PA programme. A statistical test comparing the mean differences in each physical activity at pre-test from that of post-test was done using a paired sample t-test. Means differences were compared using a paired t-test computation where a highly significant difference of t=15.61 and P=0.0001 was determined hence rejecting the 3rd null hypothesis as indicated in Table 4.27.

Table 4.27: Comparison of the learners with severe intellectual disabilities gross and sensory motor physical skills activeness at the end to that at the beginning of the child to child PA programme

Physical Activities	Mean rating At the beginning	Mean rating At the end
Gross Motor Skills		
Assisted walk 10, 25,50 metres	2.00	3.50
Running 10, 25, 50 metres dash	2.17	3.23
Standing jump	2.22	3.37
Sensory Motor Skills		
Throwing softball	2.47	3.84
Walking along an obstacle path	2.54	3.97
Tennis ball catch	2.47	4.09
Mean rating	2.312±0.87a	3.667± 0.14b
t- value	15.61	
P –value	0.0001	

Mean value in the same row denoted by different letters were significantly different at P≤ 0.05. Mean comparison using paired sample t-test.

In table 4.27 comparisons of the learners with severe intellectual disabilities gross and sensory motor skills physical activities at the end of the PA programme to that at the beginning of the child to child PA programme was conducted. This was done by establishing the mean response of the teachers on the scale of 1-5 (1-very weak, 2-weak, 3-average 4-strong, 5-very strong). The means received were compared using a paired sample t-test. The findings showed that teachers significantly (T= 15.61, P = 0.0001) highly rated gross and sensory motor skills at the end of child to child PA program (mean and the confident level rating 3.667± 0.14b) than at the beginning of the programme (mean and the confidence level 2.312±0.87a). This showed an overall improvement in the learners' performance in gross and sensory motor skills; hence, a significant difference in comparison of before and after the PA programmes. Therefore, the third hypothesis that there was no significant difference

in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after child to child PA programme was rejected.

The current study looked at individual physical activeness progress in both gross and sensory motor skills and realized improvement in almost all the skills. This affirmed by Sowa and Meulen (2012) affirmed in their study of 40% acquisition in motor skills performance. Another study by Graham et al. (2014) found that there was a clear difference in strenuous PA by sex n=126f, n=107m for children and adolescent aged 13 to 18 years. T was (223) =2.1, p 0.01 while average strenuous PA was greater for boys (m=3.9 SD=2.4) than for girls (M=1.8, SD=2.4) at the end of the PA programme. Graham et al. study looked at gender differences in PA participation while this study examined mean differences of performance of gross and sensory motor physical activities at the beginning and end of the child to child PA programmes.

On the other hand, Sowa and Meulen (2012) found out that individual interventions had a greater impact on variables such as social and motor skills than group-boosted exercise programs. The current study findings, therefore, were in line with their findings where most learners with SID gross and sensory motor physical activeness gradually improved as a result of individual follow up from pre-test, mid-test and post-test. Reduced physical activity level limits the motor skills development and is found to decline from childhood through to the adolescent years (Misra et al., 2012). Physical activity is one of the major lifestyle-related health determinants. The WHO (2018) argues that children spend more time in institutions than ever before. This has contributed to less physical activity for them while growing up. Boarding institutions including special schools for learners with intellectual disabilities have

increased the sedentary behaviours of children and adolescents. The problem worsens when individuals with severe intellectual disabilities are concerned. They are termed as incapacitated or sick by society. Therefore, they are not involved in physical education sessions and as a result, they become obese and more agitated when their peers with mild and moderate intellectual disabilities participate in physical activities. Most learners with severe intellectual disabilities are left in classes or in the dormitories during such exercise activities. According to WHO (2016), physical activity is a necessity and not a choice. Therefore, having the opportunity to enjoy quality recreation is vital to the health and personal development of all individuals, regardless of gender, functional ability, ethno cultural background, age or socio-economic status.

Children and young people are a particular concern especially those living with motor difficulties including those with severe intellectual disabilities. Persons with intellectual disabilities are often characterized by having motor difficulties both gross and sensory motor. These difficulties may influence cognitive, social or emotional areas of functioning. Therefore, work on the motor areas serves both as a therapeutic and rehabilitative (Bechar & Grosu, 2016).

4.8 Benefits Derived by both Learners with and without Intellectual Disabilities after Participating in Child to Child Physical Activities

The sixth objective of this study sought to establish benefits derived by both learners with and without intellectual disabilities after participating in child to child physical activity in primary schools in selected counties in Kenya. Descriptive data from parents and teachers' questionnaires were analyzed using frequency and percentages as indicated in tables 4.28 and 4.29.

4.8.1 Benefits Derived from Child to Child Physical Activities Programme Reported by Parents

Table 4.28: Benefits learners with SID derived from the child to child PA programmes reported by the parents

Benefits	Frequency	Percent (%)	Rank (1 – highest benefit)
It was fun	28	77.8	4
They made new friends	30	83.3	3
Learnt new physical activities skills	32	88.9	2
Increased levels of physical activities	34	94.4	1
They gained the confidence to interact with others	30	83.3	3
They got motivated to do physical activities	30	83.3	3

In table 4.28, parents stated the benefits their children had derived from the child to child PA programme activities including making new friends, having fun and learning new physical activity skills. They also increased level of physical activities, gained the confidence to interact with others and got motivated to do physical activities. Majority of parents (94.4%) stated that both children with and without severe intellectual disabilities benefited in that they increased their levels of physical activeness. Strong evidence from several studies indicates that children with intellectual disabilities benefit from physical activities if instituted in an organized manner (Tsuboi et al., 2011). Such activities improve aerobic capacity, mobility, gross motor functioning and enhance high-level participation. In the current study, use of pedometers helped to establish the number of steps each learner with and without SID made in gross motor activities. Improvement of sensory motor functioning was an added benefit in the current study.

4.8.2 Benefits Derived from Child to Child Physical Activity Programme Reported by Teachers

Table 4.29: Benefits learners with SID derived from the child to child PA programme reported by the teachers

Benefits	Frequency	Percent	Rank (1 – highest benefit)
Response to instructions	33	91.7	2
Confidence	27	75.0	3
Friendly when motivated	33	91.7	2
Makes friends freely	17	47.2	4
Self-driven physical activities	12	33.3	5
Increased level of physical activeness	34	94.4	1

In Table 4.29 PE teachers noted the benefits derived from the child to child PA programmes. They included: increased level of activeness (94.4%), response to instructions (91.7%), being friendly when motivated (91.7%), having confidence (75.0%), making friends freely (47.2%) and becoming self-driven in doing the physical activities (33.3%). Increased level of physical activeness was the highest reported benefit followed by response to instructions and friendliness. To the teachers, response to instructions was very important as this would mean easy handling of the learners with severe intellectual disabilities thereafter. Carrono and Gobbi (2012) reported that individuals with severe intellectual disabilities have low self-esteem which can cause negative consequences on their psychological balance, motivation and commitment to social exchanges. In line with the current study learners with severe intellectual disabilities were friendly when they were motivated.

This also reflected a commitment to social exchange. Bechar and Grosu (2016) also noted the benefit of social or emotional areas of functioning as well as cognition which concurs with the response to instructions benefit in the current study. Rossetti and Keenan (2017) highlighted the importance of promoting and supporting friendships of learners with severe disabilities with their typically developing peers in inclusive settings. Such relationships remain infrequent. In this study, a benefit of friendship creation was highly reported by the teachers.

4.9 Challenges Faced while Involving Learners with and without Intellectual Disabilities in Child to Child Physical Activity Programmes N=36

Objective seven of the current study sought to find out the challenges faced by PE teachers while involving learners with and without severe intellectual disabilities the organised child to child physical activity programmes in primary schools in selected counties in Kenya. Qualitative responses were coded into themes and reported descriptively in frequencies and percentages as indicated in table 4.30 and table 4.31.

4.9.1 Parents Report on Challenges Faced by Learners with and without Severe ID Participation in Physical Activities

Table 4.30: Parents report on challenges faced by learners with and without ID participation in physical activities

Mentioned Themes	Frequency	Percentage
Children with disabilities are seen as sick	15	41.67
Parents of children with ID do not allow their children to mingle with those without ID	4	11.11
Disability severity level	10	27.78
The segregated school setups for those with ID	1	2.78
Uninformed parents of children with ID	1	2.78
Lack of opportunities in school setups due to a rigid curriculum	5	13.87
TOTAL	36	100

In Table 4.30 majority (41.67%) of the parents noted that sometimes it is a bit difficult to involve children with severe intellectual disabilities to play together because the societies term them as sick. They also noted disability severity (27.78 %), as well as lack of opportunities (13.87%) in school set ups. Parents report on societal challenges reflected what they are facing due to their having children with severe intellectual disabilities. Being parents, they knew the challenge posed by their children's disability severity as they highlighted. They also witnessed their children being denied opportunities and especially when it came to sports where physical fitness can be exploited. Aimable and Etienne (2016) in Uganda concur with this when they revealed that individuals with disabilities do not participate due to lack of adapted sports equipment, lack of experts, lack of means to participate in international competitions as well as lack of finances. There is also lack of consistent transportation and knowledge among the PE teachers and parents (Block, Talicferro & Moran, 2013). Keller (2014) also adds that individuals with disabilities

are marginalized and discriminated against. However, Holecko (2016) argue that the scarcity of sports and recreational programs for children with disabilities denies them inclusion opportunities. This calls for child to child physical activity programmes for both learners with and without severe intellectual disabilities as the current study recommends.

4.9.2 Challenges Encountered by Teachers During the Child to Child PA Programmes of Learners with and without Severe Intellectual Disabilities

Teachers were asked about the challenges they encountered during the child to child physical activity programmes and gave the reports as in Table 4.31.

Table 4.31: Challenges encountered by teachers during the PA programmes of learners with and without SID

Mentioned Themes	Frequency	Percentage
Time-consuming involving learner with severe intellectual disabilities	4	11.11
Children with SID were easily destructed in the activities process	4	11.11
Disability severity level	11	30.56
Negative attitude towards disability by people	7	19.44
Regular school teachers refusing learners without ID to volunteer in PA programme due to remedial classes of other teaching subjects	1	2.78
Lack of child to child physical activities awareness by PE teachers	8	22.22
Bad weather conditions	1	2.78
Total	36	100

In table 4.31 teachers noted diverse challenges while engaging both learners with and without intellectual disabilities in the organized child to child physical activity

programmes. Majority (30.56%) mentioned disability severity that made it difficult for teachers to appropriately group the learners according to their level of ability. Teachers highlighted that the more severe the disability was the more difficult it was to involve them in the PA programme. This is because these individuals are characterized by multiple disabilities that hinder them from being active. Lack of teachers' awareness (22.22%) that they can initiate physical activities for both learners with and without disabilities was also a challenge. Teachers confirmed that no one had ever initiated such child to child PA programmes in their schools. Negative attitude (19.44%) towards learners with disabilities was another challenge. People find it hard to include learners with intellectual disabilities in societal activities. This was evident when the negative attitude was exhibited by learners without disabilities refusing to volunteer to participate in the child to child PA programme.

Block, Taliaferro and Moran (2013) support the above challenge that limit LWSID ability to engage in physical activity as lack of consistent transportation and PE teachers and parents' lack of knowledge. They further added negative attitudes and the natural barriers of multiple disabilities. In a study by Hammond, Young and Konjarski (2014) on attitudes of Australian swimming coaches towards the inclusion of swimmers with intellectual disability, athletes with an ID had difficulty following directions, remembering strategies and staying on task. They found out that groups were more likely (P=<0.001) to have more favourable beliefs towards perceived confidence of including persons with ID in the regular programs. Ginewa, Courtade, Test and Cook (2015) concur with the current study that learners with severe intellectual disabilities present significant challenges to educators while

implementing effective instructional practices. Teachers reported learners with severe intellectual disabilities as being easily destructed when receiving instruction processes and as such they fail to concentrate on a task.

The current study findings of teachers reporting on challenges faced while involving learners with severe intellectual disabilities in physical activities also supports WHO (2017) report that, there is lack of time because of adults' busy days.

4.9.3 Teachers' Recommendations on Involving both Learners with and without Severe Intellectual Disabilities in PA

Teachers were asked to give their views on learners with and without severe intellectual disabilities involvement in future and the results were as in figure 4.9.

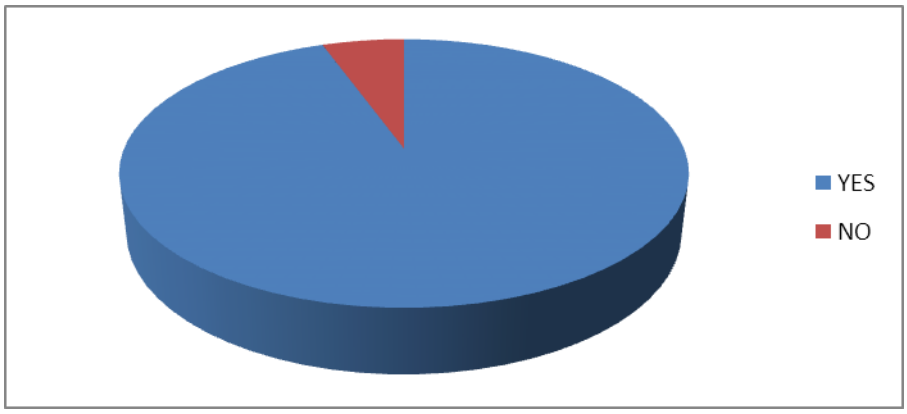


Figure 4.9: Teachers recommendations on involving both learners with and without severe intellectual disabilities in PA

In Figure 4.9, majority (94.45%) of teachers accepted that they would recommend learners with and without severe intellectual disabilities to be participating together in schools in future. This was because; learners with severe intellectual disability showed great improvement when engaged with those without SID as some stated;

"In fact, there was evidence of improvement when learners were involved in these activities"

The teachers added that surprisingly, those who had not walked for a long time made 3 to 4 steps on their own by the end of the child to child physical activity programme. One of the teachers stated;

> *"It is evident that they can make a great difference in physical activities and behaviour change as Stacy (not real name) and others did during this programme. For example, Jack (not real name) has never walked since he was admitted to this school three years ago but after these exercises, he can do at least three steps and one day towards the end he did four steps"*

From the PA programme, it was noted beyond a reasonable doubt that they can play together and those with severe intellectual disabilities can gain a lot. In one of the schools, a teacher noted;

> "*At least Moffat (not real name) seemed to be very happy and this needs to continue. Learners without a disability also liked helping those with a disability*"

From the PA programme, it emerged that learners without severe intellectual disabilities can motivate those with SID to perform. The teachers also noted that playing together really motivated those with severe intellectual disabilities. One of the teachers said;

> *"If Linnet (not real name) could nod the head after being assisted to walk to show happiness, then this should be done over and over again to perfect her response"*

A similar sentiment was made by another teacher who stated that;

> "*In the case of one, he attempted looking and cuddling the ball meaning that he realized it is a unique object and instead of eating direct, he first looked at it."*

Learners with severe intellectual disabilities were reported having benefited a lot from the child to child PA programmes. Children who had never walked from birth were reported making a few steps after participating in the organised child to child PA programmes. Others showed a sign of happiness for the first time while others could manipulate objects a skill that had not been witnessed there before especially with those who had withdrawn behaviours. It then affirms WHO (2017) emphasis that physical activity is a necessity, not a choice and having the opportunity to enjoy quality recreation is vital regardless of functional ability.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study main objective was to assess the effectiveness of organised child to child physical activity managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties in Kenya. In chapter four data were collected, analysed and findings presented and discussed. This chapter aims at presenting the summary of the findings, and drawing conclusions and recommendations for the study. It is segmented into three sub-sections; summary of the findings, conclusions and recommendations.

5.2 Summary of the Main Findings

5.2.1 Demographic Information of the Study Respondents

Demographic information included teachers' demographic information which showed that majority of the PE teachers were male while a few of them were non-committal as pertains indicating their gender. This information was derived from the PE teachers' and parents' questionnaires. It was also evident that most teachers were first degree holders, followed by diploma and finally primary school teacher certificate holders (P1). Moreover, majority had specialized in special needs education. This was proof that they would handle learners with severe intellectual disabilities with care in physical activities since they already had hands-on training. Further, their working experience strengthened their hands-on capability since majority had an experience of above 15 years.

Female parents on the other hand were found to be the majority that gave information regarding their children with SID. The male parents were less involved in giving their children's information and this was an indication of one-sided parental involvement. Parents indicated their relationship with the children and the results showed that majority were their mothers. Therefore, most of them (LWSID) lived with their biological parents and so any information given was valid and reliable since they gave first-hand information required of them.

Asked about the birth position of their children in the families, firstborns were the majority followed by others (sixth born and above). According to Mwangi (2016), children born with intellectual disabilities are either mostly firstborns when parents are ignorant of the proper pre-natal care or the very last children when the age of the mother has progressed to old age (5^{th} borne and others). The analysis showed a gradual increase in the likelihood of disability in line with this. However, there was no data from the current study findings to prove this. Parents realized that their children had a problem (severe intellectual disability) during the first to the fifth year and only a few realized it when the child was 11-15 years. This could have been a result of an adventitious disability which results after the birth of a child. It was then clear that most learners with SID were noted before they joined the school and so parents were aware of the problem. This lend to proper placement in special schools for learners with intellectual disability. This was confirmed when all parents reported that their children had been assessed by the relevant authorities.

For proper pairing of both learners with and without intellectual disability, those with severe intellectual disabilities dictated the number to be selected in each school. The inclusion and exclusion criteria resulted in a total of 36 participants with severe

intellectual disabilities. This further led to the selection of those without SID (36 participants). This, however, did not manage to produce a gender balance in each special and regular school though pairing was in line with the gender. Some schools had more gender pairing than others. In some instances, turns were taken to ensure that a learner with severe ID was supported by one without ID. Some counties had many special schools while others had few. All the special schools were 9 in number with a population of 608 learners with SID. Out of these, 210 had severe intellectual disabilities and only 36 qualified to be included in the current research.

5.2.2 Identification of Learners with Severe Intellectual Disabilities

Psychosocial Behaviours

The study intended to establish physical activities in managing psychosocial behaviours among learners with severe intellectual disabilities. Therefore, before the PA programme inception, the children's psychosocial behaviours were established. Teachers' findings showed that majority of the learners exhibited physical skill deficit followed by hyperactive behaviour and other exhibited withdrawal behaviours. The study aimed at reducing or eradicating such behaviours after PA intervention. Some children's psychosocial behaviours appeared rarely. Such included; anger, screams, temper tantrums, crying for no apparent reason and shyness respectively. In the current study, the researcher sought to manage psychosocial behaviours that were exhibited most of the time. This helped to select a manageable number of learners with SID as it entailed individual child observation of the physical activities' progression and their behaviour change. However, nature of learners with severe intellectual disabilities limited their being included in this

research fully. This is because they had conditions that warranted a doctor's scrutiny which should be a research of another time.

On comparing parents and teachers' report, the findings were similar in gauging physical activities deficit. Parents did not report any hyperactive behaviour which meant they didn't understand its characteristics as the teachers. However, their second psychosocial behaviour in the ranking was withdrawal and expulsion from peer-related activities.

5.2.3 The Extent to which Learners with Severe Intellectual Disabilities were Involved in Physical Activities

Asked how they involved learners with intellectual disabilities in PA, teachers reported having involved them every day, thrice, once and others did not involve them at all. Nevertheless, when they were asked to give involvement as per disability severity, a contradiction arose as moderately affected were the majority, followed by the severe case. None reported having involved the mildly affected learners which made the researcher to conclude that learners with mild intellectual disabilities are placed in regular primary schools and not special primary schools. Nonetheless, the findings in the current study did not have information to prove this conception.

5.2.4 Effects of Child to Child Physical Activity on Psychosocial Behaviours among Learners with SID

The study findings were segmented into three faces; before PA intervention (at pre-test), at mid-test and finally at the end of the PA programme (post-test). The findings indicated that very few learners had a significant change in their psychosocial

behaviours of withdrawal, running away from peers and physical skills deficit as reported by teachers at mid-test. Majority had an insignificant change in physical activities skill deficit, shyness, excessive fear as well as running away from peers.

At the end of the child to child PA programme, teachers reported that very few learners with SID had an insignificant change in physical activities skill deficit and hyperactive. However, a significant change was observed in physical activities skill deficit, expulsion for peer-related activities, shyness and hyperactive behaviours respectively. The report by parents agreed with that of teachers that their children's behaviour had so much improved. This was also observable in the plates 1a to 2d where learners with SID showed a lot of shyness and withdrawal behaviour but at the end of the PA programme the learner was able to even cuddle the ball.

Results on teachers rating learners with SID psychosocial behaviour change comparing before and after the PA programme showed a significant change in so many activities which meant there was a significant difference in psychosocial behaviours exhibited before and after PA programme and a significantly better rating was recorded in learners' behaviours. There was a high significant (0.0001) difference observed. Results for the current study also showed that mean differences in psychosocial behaviours before and after had a significance confidence interval of 95%. It was then concluded that the difference was as a result of regular involvement of these learners in child to child physical activity and the motivational support they got from their peers without severe intellectual disabilities.

5.2.5 Effects of Child to Child Physical Activities on Physical Activity Levels of Learners with and without SID before Pre-test and after Post-test Levels

1. Learners who Completed the PA Programme

The results also showed that not all learners with SID completed the PA programme. Similarly, there was no significant difference in the gender that completed the child to child PA programme. However, the difference between those with and without SID was as a result of sickness which affected a few learners with SID. This led to their quitting the programme before its stipulated time of ending as reported by their P.E teachers. This was also found by Temple and Stanish (2011) when they targeted 40 participants and only 34 completed their PA programme. This shows that it's very rare to have individuals with ID completing a PA programme in the same number that was targeted. This could be due to their frequent health problems as in the case of the current study. Results from teachers and research assistants involved two major areas of physical activities (gross and sensory motor physical activities) that were also analysed.

2. Learners Gross Motor Performance

Gross motor activities involved 10 metres assisted walking, 25 and 50 metres dash, and standing long jump. In both 25 metres dash and 50 metres dash, the T-test (P=0.0001) showed a significant difference in the learners with severe intellectual disability from those without intellectual disability. Those without severe intellectual disability were found to make fewer step counts at the pre-test, mid-test and post-test than those with severe intellectual disability. For both learners with and without SID, the number of steps reduced with practice in all the activities.

Learners' gross motor in standing long jump for those without an intellectual disability was also significantly different from those with severe intellectual disability. This happened at pre-test, mid-test and at post-test respectively. This however, could be as a result of severity difference since even those with severe intellectual disability differed significantly from one individual to another. All in all those without SID performed better than those with SID in all of the physical activities but the study intent was not majoring in their performance comparison. This proved that both learners with and without intellectual disabilities' level of physical activity would increase if frequently involved in physical activities. This lends to the rejection of the assumption that there was no significant relationship between regular child to child physical activities and physical activity level of learners with and without severe intellectual disabilities.

3. Learners Sensory Motor Performance

Performance of walking along obstacles activity from pre-test, mid-test and the post-test at the end of the programme for both learners with and without SID showed a significant increase. However, for learners without SID the improvement was drastically noted compared to their peers with SID. Comparison of softball throws for both learners with and without SID also showed significant differences. Learners without severe intellectual disabilities made long softball throws at pre-test, mid-test and post-test than learners with severe intellectual disabilities. In tennis ball catch, there was a significant difference in the ability to catch tennis ball between learners with and without severe intellectual disabilities. Learners without severe intellectual disabilities were able to catch tennis balls better at pre-test, mid-test and post-test than learners with severe intellectual disabilities. However, their

levels of physical activity equally changed from pre-test to mid-test to post-test which was the test variable to the assumption rejection in the sensory motor same as in gross motor performance above.

5.2.6 Comparison of Gross and Sensory Motor Skills Performance of Learners with Severe Intellectual Disabilities at Pre-test, Mid-test and Post-test Levels

1. Gross and Sensory Motor Skills at Pre-Test

From the current findings, learners with SID gross motor skills performance proved to be very weak in the running of 25 and 50 metres dash just as it was in standing long jump. The results also showed that learners with SID sensory motor skill performance was very weak in; walking along obstacles, softball throwing as well as in tennis ball catch.

2. Gross and Sensory Motor Skills Performance at Mid-test

The study findings showed an improvement of the learners' gross and sensory motor skills performance at mid-test. The teachers' report was that majority were on average ratings in tennis ball catch, followed by walking along obstacles and standing long jump respectively. This was followed by softball throwing. The last in this chronological order was the running of 25 and 50 metres dash. This indicated a gradual change in every gross and sensory motor skills performance. This affirmed the Piercy et al. (2018) that if physical activity practice is done regularly two days per week and 60 minutes per day could result in great improvements.

3. Gross and Sensory Motor Skills at Post-test

Findings from this study showed significant improvements in gross and sensory motor skills performance of children with severe intellectual disabilities after

participating in child to child PA programme. Results showed an indication of very strong performance in Tennis ball catch, walking along obstacles, softball throwing and standing long jump highest to lowest chronological ordered. However, there was an indication that most learners with severe intellectual disabilities were still weak in the running of 25 and 50 metres dash as well as standing long jump. This could be as a result of lack of enough practice and also disability severity that hinders most learners with SID's performance in gross motor physical activities.

4. Comparison of Learners with SID Gross and Sensory Motor Skills Physical Awareness at the end and at the Beginning of the Child to Child Programme

Results in the current study showed significant improvement in both gross and sensory motor skills at post-test. However, the t-test rating showed that teachers highly rated gross and sensory motor skills at the end (post-test) of the child to child programme than at the beginning (pre-test). It was proven that learners with a severe intellectual disability did improve in physical activeness when regularly involved in organized physical activities. Hence the assumption that there was no significant difference in comparing learners with severe intellectual disabilities' performance of gross and sensory motor skills before and after child to child PA programme was rejected. Therefore, this is an exercise worth continuing to improve learners with severe intellectual disabilities physical fitness hence a healthy living.

5.2.7 Benefits Derived from Child to Child Physical Activities Programme

Parents in the current study reported that learners with severe intellectual disabilities when involved in an organized physical activity programme benefited in increased levels of physical activeness, learnt new physical activities skills, made new friends,

gained confidence and got motivated respectively. Similarly, teachers' results showed an indication of learners with severe intellectual disability benefiting on an increased level of physical activeness, response to the instruction, friendly when motivated, gaining confidence, making friends freely as well as being self-driven in physical activities. These findings showed that learners with severe intellectual disabilities could benefit more from organized child to child physical activity programmes should there be such programmes in our schools (both regular and special schools). According to the Piercy et al. (2018), the education sector can take a lead role in providing opportunities for age-appropriate physical activities in all educational settings. Such opportunities include offering physical activities in schools and after-school sports. Further, public access to school facilities during and after-school hours and expanding intramural sports and schools' recreation opportunities need enhancement.

5.2.8 Challenges Faced by Teachers when Involving Learners with and without Severe Intellectual Disabilities in Child to Child Physical Activity Programmes

Findings from the current study revealed that there were challenges during the organized child to child physical activities programme. Both parents and teachers reported that disability severity slowed down their activities' performance. Some parents were reported to have denied their children without severe disabilities opportunities to mingle and play with those with severe intellectual disabilities. This happened where a replacement was to be done immediately and the researcher had already sought consent from the parent. On the other hand, learners with severe intellectual disability feared to be hurt because they are seen as sick hence, negative attitude towards disability.

Lack of knowledge and awareness of what physical activities should be offered to learners with severe intellectual disabilities was also another problem reported by teachers. Similarly, involving learners with and without severe intellectual disabilities was another challenge because it was not practised in schools. The irony was that even when such programmes were conducted, it was with the mild and moderate group and not with learners with severe intellectual disabilities. Teachers also found out that the programme consumed time in the current study. However, they promised to start such child to child physical activities programmes that will involve learners with and without severe intellectual disabilities to allow more practice. This would enhance time management as well.

5.2.9 Teachers and Parents Recommendations on Involving both Learners with and without Intellectual Disabilities in Physical Activities

In the current study, both teachers and parents recommended that learners with severe intellectual disabilities should be made to participate in physical activity at the school level. This was concluded when learners with severe intellectual disabilities portrayed a great improvement in gross and sensory motor activities performance. The results also showed a great change in some of the psychosocial behaviours that learners with severe intellectual disabilities exhibited. Learners' social interaction was also noted by both teachers and parents to have improved. Some teachers noted with surprise that learners with severe intellectual disabilities who had not walked for a long time alone made 3 to 4 steps on their own by the end of the child to child physical activity programmes. Other teachers were overjoyed to an extent of asking whether the research could continue and if the research assistants could find time to go and repeat the same processes involving the whole school.

This was according to field notes reports on the incidental happenings. This was very encouraging and if efforts could be made to involve learners with severe intellectual disabilities in organized child to child physical activity their health and physical fitness, as well as their psychosocial behaviours would improve. However, professionals in the area of assessment, physiotherapy and psychotherapy should be consulted before such activities are initiated to avoid unnecessary injuries to individuals with severe disabilities including those with severe intellectual disabilities.

5.3 Conclusion

The study findings showed that learners with severe intellectual disabilities exhibit a myriad of psychosocial behaviours including physical inactivity that limits their gross and sensory motor functioning properly. However, the study concludes that involving such individuals in organized child to child physical activity programmes inclusive of their typically developing peers would result in managing their psychosocial behaviours. Peers without severe intellectual disabilities motivated those with disabilities to perform the physical activities as well as giving them moral support. Left alone they have no self-drive to perform activities because of their low mental ability. This leads to their being segregated by peers and as such, they become withdrawn, aggressive and agitated among other psychosocial behaviours.

Involving both learners with severe intellectual disabilities and their typically developing peers creates a least restrictive environment that removes learners with severe disabilities from self-contained special school setups. The current study combined both regular and special schools to emphasize improving physical and psychosocial behaviours of learners with and without severe intellectual disabilities

through physical activity. Individuals with severe disabilities require ongoing support which can be practical during physical activity programmes. The way individuals with severe intellectual disabilities are perceived and treated by others without disabilities impacts majorly on the quality of their lives. Similarly, many people without disabilities could be willing to help out but they do not know how to start or what to do with the individuals with severe intellectual disabilities due to their diverse characteristics in mental and motor abilities.

The current study opens up an avenue to welcome people without disabilities to socially interact with individuals with severe disabilities. Involving learners with severe intellectual disabilities and their typically developing peers in organized PA creates greater opportunities for both parties to experience improved social interaction. Learners with severe intellectual disabilities also experienced a reduction of their psychosocial behaviours to a meaningful degree of change. They further improve their physical fitness among other benefits. Teachers of learners with severe intellectual disabilities were motivated to engage their learners in an organized PA activity routinely henceforth given the resources.

It was also realized that not many studies have used direct observation to assess the impact of an intervention on physical activity levels of learners with severe intellectual disabilities. The direct observation could be more suitable to assess physical activity among youth with intellectual disabilities than other objective tools. These have the ability to capture short bouts of activity and changes in movement patterns. Hinckson and Curtis (2013) note that the best approach is to combine multiple measures, preferably at least one subjective measure such as accelerometer and one objective measure like a parent's questionnaire. In the current

study, a pedometer was used along parents'/ teachers' questionnaires as well as research assistants' observations which concurred with the findings.

5.4 Recommendations

5.4.1 Recommendations to the Policy Formulators

Objective one of this study sought to identify the psychosocial behaviours exhibited by learners with severe intellectual disabilities in primary schools in selected counties in Kenya. The findings show numerous psychosocial behaviours. Therefore, it is recommended that the policies call for psychosocial behaviours identification tools development. This will help in the early behaviour management intervention.

Concerning the objective two of the current study findings concerning the involvement of learners with severe intellectual disabilities in physical activities, it was found that these individuals are less involved compared to their peers without intellectual disabilities. Of concern is when they are compared to their peers in the other severity levels of the same disability type which is not representative. Therefore, it is recommended that a well-designed age-appropriate physical activities skill in the current curriculum-based competence (CBC) be developed by physical education class policies. This should change instructional practices to better incorporate more time for learners with severe intellectual disabilities. Schools should be supported with adapted physical equipment for learners with severe intellectual disabilities to improve their physical fitness which will better their health as well as learning. This will also help in the management of their psychosocial behaviours. Kenya Institute of Curriculum Development should call for book writing on matters pertaining to physical activities for individuals with severe

disabilities. This should be done by qualified researchers and trained teachers on adapted physical activities for quality and reliability purposes. Physical education classes should be improved to provide indoor and outdoor physical activities that lack in the current curriculum activities time table.

Guided by the findings of objective three, Physical activity Programmes embracing inclusivity of both learners with and without severe intellectual disabilities should be put into place in school setups. This will enhance schools' psychotherapy activities that would enhance the management of psychosocial behaviours exhibited by learners with severe intellectual disabilities.

According to objective four findings in the current study, the physical activity level of learners with severe intellectual disabilities was found to be low. It is therefore recommended that tools for functional assessment in assessment centres be developed specifically for measuring physical activity levels of these learners with SID for early intervention initiate. Such tools would include pedometers, GT3 act graph, accelerometers among others. The assessors will be able to recommend the appropriate physical activity for individuals with severe intellectual disabilities according to age appropriateness and disability severity. This will enable teachers and caregivers to start involving children with severe intellectual disabilities in physical activities if their assessment referral form indicates so without fear of causing injury to them.

Findings as per objective five established a limitation in learners with severe intellectual disabilities performance of gross and sensory motor physical activities. The recommendation is that more time should be added to the time table for sensory

motor skills with an allowance of adaptation to cater for disability level of severity and health conditions.

The benefits established in objective six findings of involving both learners with and without severe intellectual disabilities were approved by both parents and teachers. They emphasized that learners with and without severe intellectual disabilities be allowed to participate together in physical activities at all school levels. A further recommendation would be that schools should establish physical activity programmes that involve both learners with and without severe intellectual disabilities in doing PA that does not warrant competitions. They should be just for physical fitness and enhancing socialization recreationally.

In objective, seven teachers reported that they lacked knowledge and awareness of the kind of physical activities to offer to learners with severe intellectual disabilities. Therefore, it is recommended that schools incorporate health care professionals to assess and counsel teachers on age and severity appropriateness physical activities for learners with severe disabilities. To teachers, it is also recommended that they attend pre-service courses on adapted physical activities as well as adapted physical education to gain knowledge and skills on matters pertaining learners with severe intellectual disabilities.

5.4.2 Recommendations for Physical Activity Practice

In the current study learners with severe intellectual disabilities exhibited complex difficulties in the performance of gross and sensory motor skills. This hindered them from self-driven physical activities plays. They experienced functionality difficulties and depended on their typically developing peers for support.

From the current study, learners with severe intellectual disabilities who participated in organised child to child physical activity showed an improvement in physical activities performed as well as a remarkable reduction in their psychosocial behaviours such as withdrawal, temper tantrums, excessive fear and hyperactivity. Therefore, schools need to come up with organized physical activities programmes for learners with severe intellectual disabilities and their typically developing peers. It is recommended that teachers emphasize the adapted physical activities as an intervention strategy to improve gross and sensory motor functionality of learners with severe intellectual disabilities. In the current study findings, learners with severe intellectual disabilities showed an improvement in sensory motor skills especially in throwing the softball. Learners with severe intellectual disabilities observed their typically developing peers perform the activities and took their turn in performing the same physical activities though at a slower pace. They were easily motivated by their typically developing peers than the teachers. Hence, it is recommended that school allows and organize PA programme for both learners with and without severe intellectual disabilities. This will enhance the PA practice as these learners spend more time with their peers in school than at home.

The key findings on psychosocial behaviours management were evidence-based. Consequently, it is recommended that teachers initiate physical activities as an applied behaviour modification intervention through frequently involving their learners in indoors and outdoors physical activities in an inclusive setup.

5.4.3 Recommendations for Further Research

In this study involvement of learners with severe intellectual disabilities in physical activities alongside their typically developing peers was done. Therefore, further studies in this disability severity are recommended:

1. The current study on physical activities managing psychosocial behaviours used step count pedometers to establish learners with severe intellectual disabilities physical activeness. There is a need to establish their physical activeness using advanced motion sensors like GT 3X act graphs that readily read and analyse the data. This is because there are no established physical fitness levels of individuals with severe intellectual disabilities so far in the sourced literature.
2. The study adopted the special Olympic International Physical Activities for the category termed as low ability group among learners with intellectual disabilities. More studies seeking experts and teachers' opinions on the type of physical activities they would recommend for learners with severe intellectual disabilities in Kenya are needed.
3. The research was quasi-experimental since it did not involve a control group. Another study is recommended that will use a control group to establish further the effect of physical activity on psychosocial behaviours among learners with severe intellectual disabilities.

REFERENCES

Adamek, L., Nichols, S., Tetenbaum, S. P., Bregman, J., Ponzio, C. A., & Carr, E. G. (2011). Individual temperament and problem behavior in children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *26*(3), 173-183.

Adams, D., Handley, L., Simkiss, D., Walls, E., Jones, A., Knapp, M., & Oliver, C. (2018). Service use and access in young children with an intellectual disability or global developmental delay: Associations with challenging behaviour. *Journal of Intellectual & Developmental Disability*, *43*(2), 232-241.

Alison, D.C., Charmayne, D., Beverley, T., (2014). The influence of staff training on challenging behaviour in individuals with intellectual disability: *A Review Journal of Intellectual Disabilities* Vol. 19(1)69-82. D01:10.1177/17446295145580756/2019.

Amable, S., & Etienne, T. (2016). *The challenges facing the national Paralympic committee of Rwanda in promoting participation of people with disability in sports and physical activities.* Case of Kigali City. Published Thesis, University of Rwanda, Rwanda. PASHDA 2016.

Annette A. J. van der Putten, Leontien W. M. Bossink, Niek Frans, Suzanne Houwen & Carla Vlaskamp (2017) Motor activation in people with profound intellectual and multiple disabilities in daily practice. *Journal of Intellectual & Developmental Disability*, 42:1, 1-11, DOI:10.3109/13668250.2016.1181259.

Annette, A.J., Van der Puter, Leontien, W.M., Bossinks Niek Frans, Suzanne Houwen and CARLA Vlaskamp (2017). Motor activation in people with profound intellectual and multiple disabilities in daily practice. *Journal of Intellectual and Developmental Disability* Vol 42, No1, 1-11, http://dx.doi.org/10.3109/13668250.2016.1181259.

Ary, D., Jacobs, L.C., Sorensen, C.K. & Walker, D.A.(2014). *Introduction to research in education.* (9th Ed). U.S.A: Wadsworth Cengage Learning.

Baran, F., Aktop, A., Ozer, D., Malbant, S., Aglams, E., Baraka, S. & Hutzler, Y. (2013). The effects of a Special Olympics Sports Soccer training program on anthropomentry physical fitness and skilled performance in special Olympics soccer athletes and non-disabled partners. Research in Developmental Disabilities, 34 (1), 695-709.

Bartlo, P., & Klein, P. J. (2011). Physical activity benefits and needs in adults with intellectual disabilities: Systematic review of the literature. *American Journal on Intellectual and Developmental Disabilities*, 116, 220–232. doi:10.1352/1944-7558-116.3.220.

Beadle-Brown, J., Hutchinson, A., & Whelton, B. (2012). Person-centred active support: Increasing choice, promoting independence and reducing challenging behaviour. *Journal of Applied Research in Intellectual Disabilities*, 25, 291– 307. doi:10.1111/j.1468-3148.2011.00666. x.

Beadle-Brown, J., Mansell, J., Ashman, B., Ockenden, J., Iles, R., & Whelton, B. (2014). Practice leadership and active support in residential services for people with intellectual disabilities: An exploratory study. *Journal of Intellectual Disability Research*, 58, 838–850. doi:10.1111/jir.12099.

Bechar, I. & Grosu, F. (2016). Physical activity and intellectual disabilities. *Journal of European Proceedings of Social and Behavioural Sciences.* Volume XVIII.elSSN:225–234.http//dx.doi.org/10.15405/epsbs(2357-1330).2016.12.

Bedell, G., Coster, W., Law, M., Liljenguist, K. (2013). School participation, supports and barriers of students with and without disabilities: *Child-care Health and Development.* doi:10.1111/cch.12046.

Boer, P.H., Meusm, T.E., Nombaut, L., Wandele, I., Hermans, Gysel, T., Ruinge, J., & Calders, D. (2014). The influence of sprint interval training on body composition, physical and metabolic fitness in adolescents and young adults with intellectual disability: *A Randomized Controlled Trial Clinical Rehabilitation*,28(3) 221- 231.

Bolker, B., Brooks, M., Gardner, B., Lennert, C., & Minami, M. (2012). Owls example: A zero-inflated, generalized linear mixed model for count data. Retrieved from https://groups.nceas.ucsb.edu/non-linear-modeling/projects/owls/ WRITEUP/owls.pdf.

Bordenet, A. N. (2016). *Promoting physical activities in individuals with disabilities. The University of Tennessee*. Published Ph.D Thesis Project.

Bukhala, P., Onywera, V., Toriola, A. L., & Onagbiye, S. O. (2017). Assessment of Physical Fitness Status of Athletes with Intellectual Disabilities Participating in Special Olympics Programs in Nairobi County, Kenya. *Journal of Human Ecology*, *59*(2-3), 148-155.

Bukhala, W. P., (2012). *Effects of peer tutoring programmes on social, psychomotor and physical fitness of youth with and without intellectual disabilities in Nairobi County, Kenya.* Published Thesis, Kenyatta University.

BurcuGuvendi and EkremlebentIlhan (2017) Effects of adapted physical activity applied on intellectual disability students toward level of emotional adjustment, self-managing and the socialization. Parent and teacher interactive research. Dol: 10.14687/jhs.vi414.4812.

Carronno, B., & Gobbi, H. (2012). Effects of an exercise program on anxiety in adults with intellectual disabilities. *Research in Development Disabilities*, 33(4), 1221-1226.

Chad Nocholas, Martin E Block, Jason C Bishop, Brandon Mcintire (2018). Physical Activity in young adults with autism spectrum disorder. Parental perceptions of barriers and facilitators.

Chad, Marin and Jason (2018). Prevalence of physical inactivity among young adults with disabilities. Parental perceptions of barriers and facilitators.

Chien-Yu Pan, Yu-Kai Chang, Chia-Liang Tsai, Chia-Hua Chu, Yun-Wen Cheng and Ming-Chih Sung (2017). *Journal of attention disorders* vol.21 (9)783-795: Doi: 10.1177/1087054714533192.

Connel, J., M. (2012). The relationship between physical activity and exercise motivation of the first-year students from Rezekne Augustskola. *LASE Journal of Sport Science.*

Creswell, J.W. (2005). Education research planning conducting and evaluating qualitative and quantitative Research (2nded.). Ohio: Prentice Hall.

Cyrille, B., & Aurelie, C. (2015). Relaxation therapy and anxiety, self-esteem and emotional regulation among adults with intellectual emotional regulation among adults with intellectual disabilities. A randomized controlled trial. *Journal of Intellectual Disabilities,* 1-13.

Dairo, Y, M. (2016). *Physical activities level in adults with intellectual disabilities.* A Systematic Review published Thesis.

Dairo, Y. M., Collett, J., Dawes H.J Oskrochi G.R (2016). Physical activity levels in adults with intellectual disabilities in group Homes in Hongkong with intellectual disabilities. *Medical Report* june29.doi 10.3390/ijerph15071370.

Fraenkel, J. R., & Wallen, N. E (2010). *How to design and evaluate education research*, (5th ed.). Boston: McGraw-Hill.

Ginevra R. Courtade, David W. Test, Bryan G. Cook (2015). Evidence-Based Practices of Learners with sense intellectual disability https://doi.org/10.1177/15407969/4566711.

Giulio E.L, Nirbhay M., Mark. F. O., Jeff, S., & Gloria, A. (2016). Promoting Physical Activity in People with intellectual and multiple disabilities through a basic technology-aided program. Journal of Intellectual Disabilities, Vol 22,2: pp.113124https://doi.or/10.1177.1744629516684986.

Guidetti, L., Franciosi, E., Gallotta, M. C., Emerenziani, G. P., & Baldari, C. (2010). Could sport specialization influence fitness and health of adults with mental retardation? *Research in developmental disabilities*, *31*(5), 1070-1075.

Handicap International (2013). Physical and functional rehabilitation. *Handicap International Network.www.handicap-international.org.*

Handicap International (2015). Sports and physical activities with persons with disabilities. *Handicap International Network. Hyperlink "http://www.handicapwww.handicap-international.org*.

Hassan Awan, Umesh Chauben (2017). Health Promotion and Screening for people with an intellectual disability. https://doi.org/10.1177/1755738016682982.

Hilgenkamp, T. I. M., Reis, D., van Wijck, R., & Evenhuis, H. M. (2012). Physical activity levels in older adults with intellectual disabilities are extremely low. Research in Developmental Disabilities, 33, 477–483. doi: 10.1016/j.ridd.2011.10.011.

Hinckson, E. A., & Curtis, A. (2013). Measuring physical activity in children and youth living with intellectual disabilities: a systematic review. *Research in developmental disabilities*, *34*(1), 72-86.

Holecko, C. (2016). *Programs for children with disabilities. https://www.com/sports for-children with-physical disabilities. -1256963.*

Hong Kong China (2015). Census and statistics department HKSAR. Persons with Disabilities and Chronic Diseases and Census and Statistics Department of the HKSAR.

Horner, R.H., Corr, E.G., Halle, J., McGree, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in Special Education. *Exceptional Children* 71:165-179.

Houwen, S., van der Putten, A., & Vlaskamp, C. (2014). A systematic review of the effects of motor interventions to improve motor, cognitive, and/or social functioning in people with severe or profound intellectual disabilities. Research in Developmental Disabilities, 35, 2093–2116. doi: 10.1016/j.ridd.2014.05.006.

Hylkema, T., Petitiaux, W., & Vlaskamp, C. (2011). Utility of staff training on correcting sleep problems in people with intellectual disabilities living in residential settings. Journal of Policy and Practice in Intellectual Disabilities, 8, 85–91.doi:10.1111/j.1741-1130.2011.00294. x.

International sports federation for persons with intellectual disability (2013). "http://en.wikipedia.org/wiki/international-sports-federation for pers." http://en.wikipedia.org/wiki/international-sports-federation for pers.

Keller, (2014). *Empowering the intellectually disabled through sports*. "http://www.huttingtonpoot.com/mary-davisemporing the intellectual." http://www.huttingtonpoot.com/mary-davisemporing the intellectual.

Kelso, C. (2014). Importance of physical education. Virginia Education Association. http:/.www.cultureandyouth.org/physical-education.

Kirkendall, A., Linton, k., Farris, S. (2017). Intellectual disabilities and decision making at end-of-life: A Literature Review. *Journal of Applied Research in intellectual Disabilities;* 30, 982-994. Doi: 10.111/jar.12270.

Kochung,E.(2003). Report of the task force on special needs education appraisal exercise. Ministry of Education Science and Technology. Nairobi.

Kumar, B., Robinson, R., & Till, S. (2015). Physical activity and health in adolescence. *Clinical Medicine*, *15*(3), 267-272.

Leung, W., Siebert, E. A., & Yun, J. (2017). Measuring physical activity with accelerometers for individuals with intellectual disability: A systematic review. *Research in Developmental Disabilities, 67,* 60-70.

Majid, U. (2018. Research fundamental: Study design, population and sample size. Published dissertation. University of Toronto.

Mc Conkey, R., S. Dowlings, D., Hassan & Menke, S. (2012). Promoting social inclusion through United Sports for youth with intellectual disabilities: A five nation study. *Journal of Intellectual disability Research* doi:10.1111/j.1365- 2788.01587. x.

McConkey, R., Peng, C., Merritt, M., & Shellard, A. (2019). The Meaning of Social Inclusion to Players with and without Intellectual Disability in Unified Sports Teams. *Inclusion*, *7*(4), 234-243.

Mccoy, S. M., and Morgan, K.J. (2019). Obesity, Physical Activity and Sedentary behaviours in adolescents with autism spectrum disorder compared with typically developing peers https://doi.org/10.1177/1362361319861579.

Misra, A., Nigam, P., Hills, A. P., Chadha, D. S., Sharma, V., Deepak, K. K., ... & Gupta, for the Physical Activity Consensus Group, S. (2012). Consensus physical activity guidelines for Asian Indians. *Diabetes technology & therapeutics*, *14*(1), 83-98.

Morano, S., Ruiz, S., Hwang, J. (2017). Meta-analysis of single-case treatment effects on self-injuries behaviour for individuals with autism and intellectual disabilities. https://doi.org/10.1177/2396941516688399.

Mugenda, O., & Mugenda, A. (2009). *Research methods: Quantitative and qualitative approaches.* Act Press, Kenya.

Ncube, A., C. (2014). Challenges faced by learners with severe intellectual disabilities in the acquisition of adaptive behaviour: Insight from teachers of special classes in Zimbabwe. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS).*5, 600-606.http/www.jetereps.scholarlinkresearch.com.

Ndabi, J. S. (2016). Physical activity patterns of Tanzanian school children. University of Dar es salaam. PASHDA presentation 21st -23rd 2016.

Odiango, R A. & Mse, E. (2016). Physical activity intervention on social skill development amongst learners with intellectual disabilities in an inclusive. PASHDA presentation 21ST -23RD September, 2016.

Ogg-Groenendaal, M., Hermans, H., & Claessens, B. (2014). A systematic review on the effect of exercise interventions on challenging behaviour for people with intellectual disabilities. *Research in Developmental Disabilities*, 35, 1507– 1517. doi: 10.1016/j.ridd.2014.04.003.

Olsman, Echteld, Goudoever, Willens & Nieuwenhuijse (2019). Quality of life of persons with profound intellectual and multiple disabilities. A narrative literature review of concepts, assessment methods and assessors. Journal of intellectual and developmental disability ISSN: 1469-9532 (online) Journal homepage: https://www.tandfonlin.com/10i/cjid20.

Page, E., J. (2016). Increasing physical activity for people with severe profound intellectual disabilities in the Graduate School of the Ohio State University.

Peshawaria, P. & Venkatesan, S. (2010). Behavioural Assessment Scale for Indian Children with mental retardation.

Peter J.G. Nouwens, Rosanne Lucas, Nienke B. m. Smulders, Petri J.C.M Embregts and Chijs Van Mieuwenhuizen(2016). Identifying classes of persons with mild intellectual disability or borderline intellectual functioning: A latent class analysis. Intellectual disability rights service Inc. MSW 2016, Australia. www.idis.or.au.

Piercy, K. L., Troiano, R. P., Ballard, R. M., Carlson, S. A., Fulton, J. E., Galuska, D. A., & Olson, R. D. (2018). The physical activity guidelines for Americans. *Jama*, *320*(19), 2020-2028.

Ringland, K. E. (2019, May). A place to play: the (dis) abled embodied experience for autistic children in online spaces. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (pp. 1-14).

Rintala, P., Asunta, P., Lahti, J., & Loovis, E. M. (2016). Physical fitness of individuals with intellectual disability who have Special Olympics experience. *European Journal of Adapted Physical Activity, 9*.

Ritchie, G. (2010). Treatment of dual diagnosis in mentally disordered offenders: application of evidence from the mainstream. Advances in Dual Diagnosis.

Ritchie, J. & Lewis, J. (2006). Qualitative research practise. A guide for social science student and researchers. Sage Publications, New Delhi.

Romanzini, M., Petroski, E.L., Ohero, D., Daurado, A.C.C., & Reitchet, F.F. (2014). Motering physical activity level of adolescents. *European Journal of Sport Science*. Londrina, Brazil. Department of the Physical Education State. University of Londrina.

Ross, S.W. & Horner, R.H. (2009). Bully prevention n positive behaviour support. *Journal of Applied Behaviour Analysis* 42,747-759.

Rossetti, Z., & Keenan, J., (2017). The nature of friendship between students with and without severe disabilities. https://doi.org/10.1177/0741932517703713.

Rout, R., Brunet, I., Ranger, B., Carbonneau, H., & Julie, F., (2015). Inclusive sporting events in schools for youth with disabilities in Quebec: social, educational and experiential roles of these activities according to interviewed practitioners. Dol: 10.1177/2158244015604696.

Salawu, S., Lyoka, P., A., & Goon, D. (2016). Physical motor competencies of severely mentally challenged children in King Williams Town, South Africa. PASHDA presentation 21ST -23RD September, 2016.

Shennar-Golan, V., & Walter, O. (2018). Physical activity intensity among adolescents and association with parent–adolescent relationship and well-being. *American Journal of Men's Health*, *12*(5), 1530-1540.

Smith, M., & Griffiths, C., (2016). You and me. The structural basis for the interaction of people with severe and profound intellectual disability and others. *Journal of Intellectual Disabilities* 2017. Vol 21(2) 103-117. Sagepub.co.uk/journals permissions. Nav Doi; 10.1177/17446295/6644380.

Snijders, T.A.B., & Bosker,R. J. (2012). Multilevel analysis: An introduction to basic and advanced multilevel modeling (2nd ed.) London, UK: Sage. Leuven, Belgium: Acco.

Sprake, A., & Walker, S. (2015). 'Blurred lines' The duty of physical education to establish a unified rationale. *European Physical Education Review, 21*(3), 394-406.

Staurt, J. F., Dorothea, D., Taylor S., Curry, W. Bronagh M., Gareth, S. (2017). Fitness, fatness and reallocation of time between children's daily movement behaviours: *An analysis of composition data*.Doi 10.1186/s12966-017-0521-z.

Stuffard, L., Berefod, B., Clarke, S., Beecham, J., & Curtis, J. (2015). A preliminary investigation into the effectiveness of a group delivered sleep management intervention for parents of children with intellectual disabilities. *Journal of Intellectual Disabilities* 2015, Vol 19(4). 342-355. Sagepub.co.uk/Journals permissions. Nav Doi:10.1177/17446295/5576610.

Takahiro Sato, Justin A Haegele (2001). Graduate Students Practicum Experiences Instructing Students with severe and profound disabilities in physical education. *European Physical Education Review*, vol 23, 2: 196-211.

Tashakkori, A., & Teddlie, C. (Eds), (2008). *Hardbook of mixed methods in social and behavioural research*. Thousand Oaks, CA: Sage.

Temple, V.A., & Stanish, H. I. (2011). The feasibility of using a peer- guided model to enhance participation in community. Based physical activity for youth with intellectual Disability. *Journal of Intellectual Disabilities,* 15(3)209-217).

Tonkin B., L., Ogilvie, B.D., Greenwood, L.C., & Anaby, D., R. (2014). The participation of children and youth with disabilities in activities outside of school. *A Scoping Review Canadian Journal of Occupational Therapy.*

Tsuboi, S., Hayakawa, T., Kanda, H., & Fukushima, T. (2011). Physical activity in the context of clustering patterns of health-promoting behaviors. *American Journal of Health Promotion*, *25*(6), 410-416.

UNCRPD (2006). *The United Nations Convention on the Rights of Persons With Disability.*

Van der Putten, A. A. J., Houwen, S., & Vlaskamp, C. (2015). Motor functioning in people with severe or profound intellectual disabilities: A neglected opportunity for research? A Systematic Review.

Vanfleets, R., Sywulak, A. E., & C.C. (2010). *Child centered therapy*. New York: The Guilford Press.

Voss, H., Vogel, A., Wagemans, A.M.A., Francke, A.L., Metsemakers, J.F., Courtens, A.M., Veer, A. J.E. (2019). Advance care planning in the palliative phase of people with intellectual disabilities: Analysis of medical files and interviews. *Journal of Intellectual Disability Research*, 63, 1262-1272 doi:10.1111/jir.12664.

Wachira, L.M. (2014). *Physical activity screen- Based sedentary behaviour, Dietry habits and adiposity of 9 to 11-year-old school children.* Nairobi County, Kenya. Published Thesis.

Waninge, A., van der Putten, A. A. J., Stewart, R. E., Steenbergen, B., van Wijck, R., & van der Schans, C. P. (2013). Heart rate and physical activity patterns in persons with profound intellectual and multiple disabilities. *Journal of Strength and Conditioning Research,* 27, 3150–3158. doi:10.1519/JSC.0b013e31828bf1aa.

Watson, (2016b). Supporters willingness to see the person they supported beyond their disability was found to impact their responsiveness.

Watson, J. (2016a). Assumptions of decision-making capacity. The role supporter attitudes play in the realization of the rights of people with severe or profound intellectual disability. *Laws*, 5(1), 1-9. Doi: 10.3390/laws 5010006.

Wehmeyar, M.L., Shogren, K. A., Zagar, D. T., Smith E.C. and Simpson, R. (2010). Education and Training in Autism and Development Disabilities, 2010, 45(4). 475-486. Self-determinations and social interactions in ASD.

Westendorp, M., Hartman, E., Houwen, S., Smith, J., & Visscher, C. (2011). The relationship between gross motor skills and academic achievement in children with learning disabilities. *Research in developmental disabilities*, *32*(6), 2773-2779.

Westendorp, M., Houwen, S., Hartman, E., & Visscher, C. (2011). Are gross motor skills and sports participation related in children with intellectual disabilities? *Research in developmental disabilities*, *32*(3), 1147-1153.

WHO (2016). Ending childhood obesity. Report of the Commission.www.who.int.

Wiski, M., Madolska, A., McConkey, R. & Hassan, D. (2012). Personal development of participants in Special Olympics Unified Sports teams. *Human Movement*, 13(3), 217.

Yolder, P.J., Lioyd, B.P., & Symons, F.J. (2018). Observational Measurement of Behaviour (2nd ed.). Baltimore, MD: Paul H. Brodus 272 pp.8 & 59.95. ISBN: 978/6812.52469.

APPENDICES

APPENDIX A

INFORMED CONSENT FOR PARENTS

Study Title: Child to child physical activities managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties, Kenya.

Researcher: Makanya Margaret Wanjiru

Study location: Komothai, Mukeu, Karatina, Ngarenaro, Muthengera, Olng'arua, Percy Davies, Don Orion and Kirunguru special and regular primary schools.

Introduction: My name is Makanya Margaret Wanjiru, a PhD student at Kenyatta University. I will be investigating child to child physical activities managing psychosocial behaviours among learners with severe intellectual disabilities. The programme includes physical activities for gross and sensory motor skill performance by learners with severe intellectual disabilities. I will incorporate learners without disabilities to motivate those with severe intellectual disabilities in the performance of the skills. This will enhance inclusive physical activities of both learners with and without intellectual disabilities in the society as well as managing their psychosocial behaviours.

Procedures to be Followed: I will be using research assistants and physical education teachers to run the programmes. I also intend to use P.E teachers' and parents' questionnaires. I will also use a gadget (pedometer) to measure the physical activity level of both learners with and without intellectual disabilities. The pedometer will be placed at the belt on the side waist where it will be in contact with the body. Equally, I will take photos and videos of participants which will be blurred to protect the identity of the participants. The researcher will monitor the progress of the programme together with the research assistants. You have the right to refuse or withdraw your child's participation in this study.

Discomfort and risks: The researcher will conduct the physical activities training and no risks are anticipated.

Benefits: This will enhance physical activeness among learners with severe intellectual disabilities as well as management of their psychosocial behaviours.

Confidentiality: Your child's involvement will be highly appreciated and the information given will be confidential and will be for this research only. It is only the consent form that will have your child's name. A personal code will be used to identify the questionnaire that you fill.

Contact information

If you have any questions you may contact me, on 0711948644 or my Supervisors Prof. Geoffrey K. Karugu on 0716916439 and Dr. Hannington B. Mugala on 0722677266 or the Kenyatta University Ethical Review Committee Secretariat on HYPERLINK "mailto:kuerc@ku.ac.ke" kuerc@ku.ac.ke.

Participant's statement

I have read/was read for the information above regarding my child's involvement in the research. I have been able to ask questions on the same and answered satisfactorily. I, therefore, consent voluntarily on behalf of myself and my child's participation.

Name of parent ……

_____ _____

Signature or thumbprint Date

THUMB PRINT

Investigator's statement

I, the undersigned, have explained to the parent in a language he/she understands the procedures to be followed in the study and the risks and benefits involved.

Name of **Investigator** ……

Investigator signature	Date

APPENDIX B

INFORMED CONSENT FOR P.E TEACHERS

Study Title: Child to child physical activities managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected counties, Kenya.

Researcher: Makanya Margaret Wanjiru

Study location: Komothai, Mukeu, Karatina, Ngarenaro, Muthengera, Olng'arua, Percy Davies, Don Orion and Kirunguru special and regular primary schools.

Introduction: My name is Makanya Margaret Wanjiru, a PhD student at Kenyatta University. I will be investigating child to child physical activities managing psychosocial behaviours among learners with severe intellectual disabilities. The programme includes physical activities for gross and sensory motor skill performance by learners with severe intellectual disabilities. I will incorporate learners without disabilities to motivate those with severe intellectual disabilities in the performance of the skills. This will enhance inclusive physical activities of both learners with and without intellectual disabilities in the society as well as managing their psychosocial behaviours.

Procedures to be Followed: I will be using research assistants and physical education teachers to run the programmes. I will also use a gadget (pedometer) to measure the physical activity level of both learners with and without intellectual disabilities. The pedometer will be placed at the belt on the side waist where it will be in contact with the body. Equally, I will take photos and videos of participants which will be blurred to protect the identity of the participants. The researcher will monitor the progress of the programme together with the research assistants. You have the right to refuse or withdraw from participating in this study.

Discomfort and risks: The researcher will conduct the physical activities training and no risks are anticipated.

Benefits: This will enhance physical activeness among learners with severe intellectual disabilities as well as management of their psychosocial behaviours.

Confidentiality: Your involvement will be highly appreciated and the information given will be confidential and will be for this research only. It is only the consent form that will have your name. A personal code will be used to identify the questionnaire that you fill.

Contact information

If you have any questions you may contact me, on 0711948644 or my Supervisors Prof. Geoffrey K. Karugu on 0716916439 and Dr. Hannington B. Mugalla on 0722677266 or the Kenyatta University Ethical Review Committee Secretariat on HYPERLINK "mailto:kuerc@ku.ac.ke" kuerc@ku.ac.ke.

Participant's statement

I have read the information above and I consent voluntarily to participate in the research.

Teachers Name: _____ Signature: _____ Date: _____

Investigator's statement

I, the undersigned, have explained to the parent in a language he/she understands the procedures to be followed in the study and the risks and benefits involved.

Name of **Investigator** ……

_____ _____

Investigator signature Date

APPENDIX C

Programme Frequency Attendance Checklist

Respondents	**Age**	**Gender**	**Education level**	**Roleplaying**
Learners with ID				
PE teachers				
Learners without ID				
Research assistants				

APPENDIX D

QUESTIONNAIRES FOR PARENTS

Section A

1. Gender

   i) Male ☐ ii) Female ☐

2. How are you related to the child with an intellectual disability?

   i) Mother ☐ ii) Father ☐ iii) Guardian ☐

   iv) Specify any other relationship (e.g. brother, sister, etc). .....

3. What birth position is your child?

   i) 1st ☐ ii) 2nd ☐ iii) 3rd ☐ iv) 4th ☐ v) 5th ☐

SECTION B

4. Do you know that your child has a unique problem?

   i) Yes ☐ ii) No ☐

5. At what age did you realize that he/she has a unique problem?

a) Ages 1-5 ☐ b) 6-10 ☐ c) 11-15 ☐ d) Above 15 ☐

6. What behaviours of not interacting with others does your child exhibit while with the siblings at home and how often? tick appropriately.

BEHAVIOUR ASSESSMENT TOOL

Learners with severe ID showing psychosocial behaviours for the last 2 weeks

Externalized behaviours	**Not at all**	**Rarely**	**Sometimes**	**Often**	**Most of the time**
1. Withdrawal					
2. Anger					
3. Screams					
4. Crying for no apparent reason					

5. Hitting others					
6. Hitting objects					
7. Temper tantrums					
8. Running away from peers					
9. Biting others					
10. Expulsion from peer-related activities					
11. Showing excessive fear					
12. Shyness					
13. Physical activity skill deficit					

Adapted from Behavioural Assessment Scale for Indian Children with mental retardation. Part B (BASIC-MRE) Peshawarua and Venkatesan (1992) for assessing problem behaviours among children with mental retardation.

7. Was your child assessed as having intellectual disabilities before placement in school?

   i) Yes ☐ ii) No ☐

SECTION C

8. a) How has the physical activities programme changed your child's behaviour? Tick appropriately

No change	Little change	Moderate change	So much change	Changed completely

b) How has your child's relationship with others improved? Tick appropriately

No Improvement	Little Improvement	Moderate Improvement	So much Improved	Improved completely

9. Would you recommend learners with and without intellectual disability to be participating together in physical activities?

i) Yes ☐ ii) No ☐

10. Which benefits below would you say your child derived from child to child physical activities programme?

i) It was fun ☐

ii) They made new friends ☐

iii) Learnt new physical activities skills. ☐

iv) Increased level of physical activeness ☐

v) They gained the confidence to interact with others ☐

vi) They get motivated to do physical activities willingly. ☐

11. What do you think hinders learners with and without intellectual disabilities from participating in physical activities together? .....

.....

APPENDIX E

QUESTIONNAIRES FOR PE TEACHERS

SECTION A

Demographic

1. Gender: i) Female ☐ ii) Male ☐

2. Grade level: i) P1 ☐ ii) Diploma ☐ iii) Degree ☐

iv) Masters ☐ v) PhD ☐

3. Specialization: i) Special Education ☐

ii) Regular ☐

iii) ECDE ☐

4. Working experience: i) 1-5 ii) 10-15 ☐ iii) above 1 ☐

SECTION B

5. What psychosocial behaviours do your learners exhibit and how often? Tick appropriately

BEHAVIOUR ASSESSMENT TOOL

Learners with severe ID showing psychosocial behaviours for the last 2 weeks

Externalized behaviours	**Not at all**	**Rarely**	**Sometimes**	**Often**	**Most of the time**
1. Withdrawal					
2. Anger					
3. Screams					
4. Crying for no apparent reason					
5. Hitting others					
6. Hitting objects					
7. Temper tantrums					
8. Running away from					

peers					
9. Biting others					
10. Expulsion from peer-related activities					
11. Showing excessive fear					
12. Shyness					
13. Physical activity skill deficit					

Adapted from Behavioural Assessment Scale for Indian Children with mental retardation. Part B (BASIC-MRE) Peshawarua and Venkatesan (1992) for assessing problem behaviours among children with mental retardation.

6 a) Were your learners assessed as having intellectual disabilities before placement in school?

ii) Yes ☐ ii) No ☐

b) Among these assessed were there those assessed as having severe intellectual disabilities?

i) Yes ☐ ii) No. ☐

c) How often is this behaviour exhibited? Tick only one

Rarely	Sometimes	Often	Most of the time

7. How often do you involve your learners in physical activities (PE) in a week? Tick only one

i) Once ☐

ii) Twice ☐

iii) Thrice ☐

iv) Everyday ☐

v) Not at all. ☐

SECTION C:

8 a) How can you rate the changes in psychosocial behaviours among LWSID by the end of the child to child physical activities programme? Tick only one in the table below.

Learners with severe ID showing psychosocial behaviour change

Externalized behaviours	**No change**	**Little change**	**So much change**	**Changed completely**
1. Withdrawal				
2. Anger				
3. Screams				
4. Crying for no apparent reason				
5. Hitting others				
6. Hitting objects				
7. Temper tantrums				
8. Running away from peers				
9. Biting others				
10. Expulsion from peer-related activities				
11. Showing excessive fear				
12. Shyness				
13. Physical activity skill deficit				

b) Following your observation and involvement in the organized physical Activities Programme for both learners with and without ID, how would you rate their social interaction improvement? Tick only one in the table below.

Social Interaction Improvement Analysis Assessment Scale for Learners with Severe ID (Pre-post test scores of social interaction)

Response to instructions	**No Improvement**	**Little improvement**	**Moderate improvement**	**A lot of improvement**	**So much improvement can interact freely**
Sociability					
Activity persistence					
Distractibility					
Emotional reactions					
Self-driven physical activeness					

9. a) How can you rate the gross motor and sensory motor skills physical activeness of both learners with and without intellectual disability at the beginning of the child to child physical activities programme.

Gross motor and Sensory Motor Skills Performance Scale

	Baseline level performance	**Very weak**	**Weak**	**Average**	**Strong**	**Very strong**
Gross Motor Skills						
• Assisted walk 10,25,50 metres						
• Running 10,25,50 metres Dash						
• Standing jump						
Sensory motor						
• Playing softball						
• Walking along an obstacle path						

b) How can you rate the Gross motor and Sensory motor skills physical activeness of both learners with and without intellectual disabilities at the end of the child to child physical activities programme?

Gross motor and Sensory Motor Skills Performance scale

Skills	**Baseline level performance**	**Very weak**	**Weak**	**Average**	**Strong**	**Very strong**
Gross motor						
• Assisted to walk 10,25,50 metres						
• Running10,25, 50 metres Dash						
• Standing jump						
Sensory motor						
• Playing softball						
• Walking along an obstacle path						

10. Which benefits below would you say LWSID derived from that child to child physical activity programme? Tick as many as possible.

i) Response to instruction ☐

ii) Confidence ☐

iii) Friendly when motivated ☐

iv) Makes friends freely ☐

v) Self- driven physical activities ☐

vi) Increased level of activeness ☐

11. What challenges did you encounter while engaging both learners with and without intellectual disabilities in organized child to child physical activities programme?

.....……

……

……

……

12. Would you recommend LWID and those without to be participating together in our schools? YES

Yes ☐ ii) No ☐

If Yes, why.....

……..

APPENDIX F

DESCRIPTION OF THE PHYSICAL ACTIVITIES AND THE ASSESSMENT OF THE SAME

Aim: physical activities management of psychosocial behaviour among learners with severe intellectual disability

Design: single – subject quasi-experimental (without a control group)

Setting: school-based intervention

Sample: learners with and without intellectual disabilities; N=72 started the program ----------completed - females --------males

Program Name: child to child physical activity

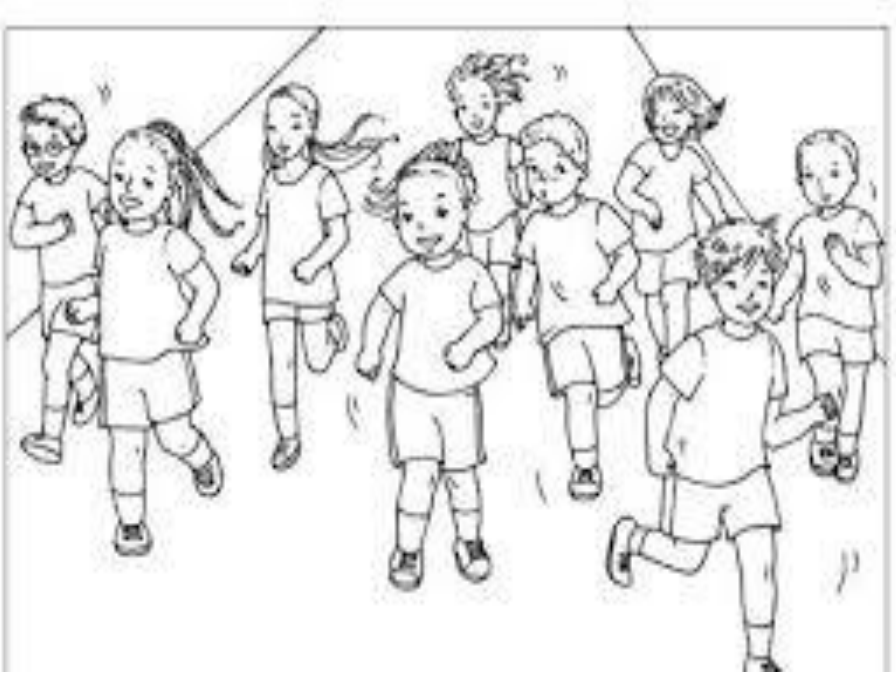
Intervention Description: 72 learners with and without intellectual disabilities were purposely assigned to three gross meter and three sensory meter physical activities. The gross meter activities included assisted 10 meters walk, running 25 meters dash, running 50 meters dash and standing long jump. The sensory motor physical activities included walking along with obstacles, throwing a softball and catching a tennis ball. Teachers and research assistants were trained on how to guide the learners to perform the physical activities. First, the learners without intellectual disabilities were instructed alone on how to perform; later both learners with and without severe intellectual disabilities. Learners with severe intellectual disabilities required a combined effort of their typically developing peers, research assistants and the PE teachers for them to perform effectively. Assessment which was not difficult for learners with severe intellectual disabilities was the most appropriate for the current study. The researcher used physical activity direct measures. Direct measures intended behavioural observations and pedometers reading. Pedometers

are gadgets that have been used by other researchers and proven to be valid and reliable for measuring physical activeness step counts for children aged 10-15 years old.

APPENDIX G

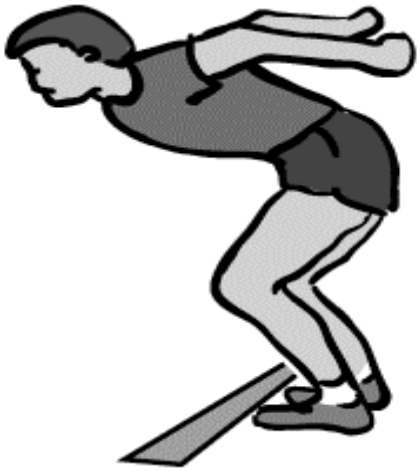
Programme Gross Motor Physical Activities

Age 10- 15 years Assisted Walking



Age 10-15 years Child-Child group running

Age 10-15 years Child-Child running



Age 10-15 years Standing Long Jump

APPENDIX H

Programme Sensory Motor Physical Activities

Age 10-15 years Child-Child Playing a Soft Ball/Tennis Ball

Age 10-15 years children walking along the obstacle path

APPENDIX I

MAP OF LAIKIPIA, MURANG'A AND KIAMBU COUNTIES


MATHIOYA
MURANGA
WEST
KAHURO
KIGUMO
Kigumo
MURANGA
COUNTY
MURANGA
SOUTH
KANGARA
Kandara
Kenol
Makindu
GATANGA


GATUNDU N.
GATUNDU S.
LARI
GITHUNGURI
THIKA
JUJA
LIMURU
KIAMBAA
KIAMBU
RUIRU
KABETE
KIKUYU

APPENDIX J

RESEARCH AUTHORIZATION LETTERS

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: kubps@yahoo.com
dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: N85/32693/15

Date: 11th September, 2017

The Director General,
National Commission for Science, Technology & Innovation,
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. MAKANYA M. WANJIRU REG. NO. E83/27099/13

I write to introduce Ms. Wanjiru who is a Postgraduate Student of this University. She is registered for a Ph.D. degree programme in the **Department of Special Needs Education in the School of Education.**

Ms. Wanjiru intends to conduct research for Ph.D. thesis entitled **"Child to Child Physical Activity Managing Psychosocial Behaviours among Learners with Severe Intellectual Disabilities in Primary Schools in Selected Counties, Kenya"**

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

RM/cao

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

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Nairobi, 00100

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Tel: 8710901/12

Our Ref: **KU/ERC/RE-REVIEW/VOL.1** (52)

Date: 29th January 2018

Margaret Wanjiru Makanya
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

Dear Margaret,

APPLICATION NUMBER- PKU/748/I816 'CHILD TO CHILD PHYSICAL ACTIVITY MANAGING PSYCHOSOCIAL BEHAVIOURS AMONG LEARNERS WITH SEVERE INTELLECTUAL DISABILITIES IN PRIMARY SCHOOLS IN SELECTED COUNTIES KENYA.

1. **IDENTIFICATION OF PROTOCOL**

The application before the Committee is with a research topic **PKU/748/I816** 'Child to Child Physical Activity Managing Psychosocial Behaviours among Learners with Severe Intellectual Disabilities in Primary Schools in Selected Counties, Kenya" received on 10th October, 2017 and deliberated on the 16th of January, 2018 and received on 19th January 2018 for re-review and deliberated on.

2. **APPLICANT**

Margaret Wanjiru Makanya

3. **SITE**

Selected Counties, Kenya.

4. **DECISION**

The Committee has considered the research protocol in accordance with the Kenyatta University Research Policy (Section 7.2.1.3) and the Kenyatta University Review Committee Guidelines **AND APPROVED that the research may proceed for a period of ONE year from 19th January, 2018.**

ADVICE/CONDITIONS:

That you will add in your consent form a provision for a Witness Signature and Date. Ensure that:

i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this Committee immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KU-ERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space Provided below and return to KU-ERC a copy of the letter.

APPROVED
29 JAN 2018
OFFICE OF THE CHAIRMAN
ETHICS REVIEW COMMITTEE

DR. TITUS KAHIGA.
CHAIRMAN ETHICS REVIEW COMMITTEE

KENYATTA UNIVERSITY
P.O. BOX 43844 - 00100 NAIROBI
APPROVED
29 JAN 2018
OFFICE OF THE CHAIRMAN
ETHICS REVIEW COMMITTEE

I MAKANYA MARGARET WANJIKU accept the advice given and will fulfill the conditions therein.

Signature..M.. ..... Dated this day of... 29TH JANUARY .....2018.

C.c. DVC Research Innovation and Outreach

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

STATE DEPARTMENT OF EDUCATION

Telegrams: "Education" LKP.
Telephone: 062-31518, 31519
Email:laikipiacountydirector@yahoo.com

When replying please quote:
Ref: LPA/C/A/01.VOL.5/(591)

County Director of Education,
Laikipia County,
P.O. Box 253.
NANYUKI.

12th February, 2018

TO: WHOM IT MAY CONCERN

RE: RESEARCH AUTHORITY – MARGARET WANJIRU MAKANYA

The National Commission For science Technology and Innovation letter Ref: **NACOSTI/P/18/67651/21146** dated **2nd February, 2018** refers.

This is to inform you that the above named person has been authorized to carry out research on **"Child to child physical activity managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools ."** You have been authorized to undertake research in **Laikipia County** for the period ending **2nd February, 2019**

Kindly assist him where possible.

COUNTY DIRECTOR OF EDUCATION
LAIKIPIA

NOORDIN MOHAMMED
For: COUNTY DIRECTOR OF EDUCATION,
LAIKIPIA COUNTY.

C.C.
National Commission for Science,
Technology and Innovation,
NAIROBI.

The County Commissioner,
LAIKIPIA COUNTY.

THE PRESIDENCY
MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT

When replying please quote
Tel: 062-2031874
E-MAIL: *cclaikipiacounty@yahoo.com*

COUNTY COMMISSIONER
LAIKIPIA COUNTY
P.O. BOX 11-10400
NANYUKI

Ref. NO. CC.ED.12/14 VOL.1/(155)

12TH December, 2018

Margaret Wanjiru Makanya
Kenyatta University
P.O. Box 43844 – 00100
NAIROBI

RE: RESEARCH AUTHORIZATION

This is to confirm the above mentioned has been authorized to undertake research in Laikipia County for the period ending 2nd February, 2019 "***Child to child physical activity managing psychosocial behaviors' among learners with severe intellectual disabilities in primary schools in selected Counties, Kenya"***

Any support accorded is welcome.

COUNTY COMMISSIONER
LAIKIPIA

B. M WANGECHI
FOR: COUNTY COMMISSIONER
LAIKIPIA

CC.
All Deputy County Commissioners
LAIKIPIA

MINISTRY OF EDUCATION
STATE DEPARTMENT OF BASIC EDUCATION

Email: cdemuranga@gmail.com
Telephone: 060 2030227
When replying please quote

COUNTY DIRECTOR OF EDUCATION
P.O BOX 118 – 10200
MURANG'A

REF: MGA/CTY/GEN./64/VOL.II/83 **9th February, 2018**

Margaret Wanjiru Makanya
Kenyatta University
P.O.Box 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

The County Education office is in receipt of your request and authority letter from the National Commission for Science, Technology and Innovation; reference No. NACOSTI/P/18/67651/21146/ dated 2ND February, 2018 to carry research on **"Child to child physical activity managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected Counties, Kenya.**

Authority is hereby granted to carry out research in **Murang'a County** for a period ending **2nd February, 2019.**

for Charles Khayira
County Director of Education
MURANG'A

COUNTY DIRECTOR OF EDUCATION
MURANG'A
03 FEB 2018
P. O. Box 118-10200, MURANG'A

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/67651/21146**

Date: **2nd February, 2018**

Margaret Wanjiru Makanya
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Child to child physical activity managing psychosocial behaviours among learners with severe intellectual disabilities in primary schools in selected Counties, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Kiambu, Laikipia and Murang'a Counties** for the period ending **2nd February, 2019.**

You are advised to report to **the County Commissioners and the County Directors of Education, Kiambu, Laikipia and Murang'a Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GP Kalerwa
GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

COUNTY DIRECTOR OF EDUCATION
KIAMBU COUNTY
P. O. Box 2300-00900
KIAMBU

Copy to:

The County Commissioner
Kiambu County.

The County Director of Education
Kiambu County.

APPENDIX K

RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MS. MARGARET WANJIRU MAKANYA
of KENYATTA UNIVERSITY, 0-100
NAIROBI,has been permitted to conduct
research in *Kiambu , Laikipia ,*
Muranga Counties

on the topic: *CHILD TO CHILD PHYSICAL ACTIVITY MANAGING PSYCHOSOCIAL BEHAVIOURS AMONG LEARNERS WITH SEVER INTELLECTUAL DISABILITIES IN PRIMARY SCHOOLS IN SELECTED COUNTIES KENYA*

for the period ending:
2nd February,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/67651/21146
Date Of Issue : 2nd February,2018
Fee Recieved :Ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 17364

CONDITIONS: see back page