MOTHERS’ INVOLVEMENT IN EARLY IDENTIFICATION AND INTERVENTION FOR CHILDREN WITH AUTISM IN NAIROBI CITY COUNTY, KENYA

By

ONALA JOHN OUMA
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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Onala, John Ouma

Date 29/06/2016

E83/13593/2009

This thesis has been submitted with our approval as University supervisors.

Prof. Geoffrey Karugu
Department of Special Needs Education
Kenyatta University

Date 29/06/2016

Dr. Madrine Kingendo
Department of Special Needs Education
Kenyatta University
DEDICATION

To my friends Dr. Mary Runo, former supervisors Professor Geoffrey Karugu and Dr Madrine Kingendo who encouraged me to do my best even when I was stuck. My wife Mary and children Faith, Ezra and Emma for the sacrifices they made when I was studying.
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**ABBREVIATIONS AND ACRONYMS**

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<thead>
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<tbody>
<tr>
<td>ABA</td>
<td>Applied Behaviour Analysis</td>
</tr>
<tr>
<td>ADI-R</td>
<td>Autism Diagnosis Interview-Revised</td>
</tr>
<tr>
<td>ADOS-G</td>
<td>Autism Diagnostic Observation Schedule</td>
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<tr>
<td>ASD</td>
<td>Autistic Spectrum Disorder</td>
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<tr>
<td>ASSQ</td>
<td>Autism Spectrum Screening Questionnaire</td>
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<tr>
<td>CARS</td>
<td>Childhood Autism Rating Scale</td>
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<tr>
<td>CAST</td>
<td>Childhood Asperger Syndrome Test</td>
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<tr>
<td>CHAT</td>
<td>Checklist of Autism in Toddlers</td>
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<tr>
<td>DSM</td>
<td>Diagnostic Statistical Manual</td>
</tr>
<tr>
<td>GARS</td>
<td>Gilliam Autism Rating Scale</td>
</tr>
<tr>
<td>IQ</td>
<td>Intelligence Quotient</td>
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<tr>
<td>M-CHAT</td>
<td>Modified Checklist of Autism in Toddlers</td>
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<tr>
<td>MTT</td>
<td>Mothers to Toddlers</td>
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<tr>
<td>NAS</td>
<td>National Autistic Society</td>
</tr>
<tr>
<td>PECS</td>
<td>Picture Exchange Communication System</td>
</tr>
<tr>
<td>RDI</td>
<td>Relationship Development Intervention</td>
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<tr>
<td>SEP</td>
<td>Special Education Professionals</td>
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<tr>
<td>STAT</td>
<td>Screening Tool for Autism in Two-Year-Olds</td>
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<td>TEACCH</td>
<td>Treatment and Education of Autistic and Communication Handicapped Children</td>
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ABSTRACT

The importance of early intervention for children with autism and those at risk cannot be overemphasised. Early intervention is important in stimulating development in formative years and reducing the chances of developing secondary disabilities in children at risk and those with developmental disabilities. The purpose of this study was to investigate the outcomes of mothers’ involvement in early identification and intervention for children with Autism. This study was guided by the theory of social constructivism which recognises learning as an active process where the learner interacts with the environment and acquires new skills and behaviours. The study adopted the survey research design. Purposive sampling was used to choose institutions that cater for children with autism in Nairobi City County. Questionnaires, interview schedules and observation schedules were used to collect data from parents, occupational therapists and teachers. Ten schools, two Mothers to Toddlers’ Programmes and ten home school programmes were chosen for the study. Parents of children with autism were randomly chosen from the institutions to fill in the questionnaires while the teachers and occupational therapists were interviewed to provide information on early intervention strategies they used. Observation schedules were used to collect qualitative data from Mothers to Toddler’s programmes, Home Based Schools and Schools. Quasi-statistical approach was used to analyse both statistical and descriptive data. The research found that mothers who identified their children early and took part in early intervention had significant reduction in the symptoms of autism in their children. Children who were identified very late and those whose mothers did not take part in interventions did not register significant reduction in the symptoms of autism. The research found that some mothers identified children with autism as early as two years while others were identified as late as thirteen years. The study concluded that parents, teachers and therapist should work together in early identification and intervention of children with autism and those at risk. Intensive early intervention was found to yield better results and should be recommended. The study recommended that the training curriculum for teachers and therapists should include early identification and intervention to make it easy for them to identify children with autism in early years. It further recommended that awareness campaign should be carried out to equip parents with information on early identification and intervention so that they can actively participate in the process.
CHAPTER ONE

INTRODUCTION

1.0. Introduction

This chapter outlines background to the study, statement of problems, purpose of the study, objectives of the study, research questions, significance of the study, scope and limitation of the study, assumptions, theoretical framework, conceptual clarification for understanding early identification and intervention, conceptual framework and definitions of operational terms.

1.1. Background to the Study

Autism is a neurodevelopmental disorder that adversely affects social skills, communication, self-help, behaviour and constructive play. It typically presents itself within the first three years of a child’s life (Scott and Gillis, 2010). Epidemiological research in the United States of America indicates that the number of children diagnosed with autism and autistic spectrum disorders (ASDs) is rising (Burton, 2002 and Rettner 2015). This increase in the number of children being diagnosed is causing concerns to parents, special educators and medics which may require integrated approach in identification involving parents working with professionals. Chamak, Bonniau, Jaunay and Cohen (2008) asserts that this higher prevalence may be partially due to better detection, assessment procedures or increased awareness and expanded classification criteria on the one hand. While on the other hand, it could be due to changes in lifestyle
such as poor dieting, environmental pollution from heavy chemicals like mercury and lead which are increasingly being used in domestic chemicals.

Early identification and intervention of children with autism has been found to be vital in helping children acquire basic skills in early years as well as helping the family to cope with the unique needs of the child with autism such as difficulty with communication, socialisation and challenging behaviour (Scott, 2009). Wolfberg (2009) explains that there are three main reasons to consider early intervention for children with autism. First, early intervention services enhance child development before the child acquires secondary disabilities. Intervention research suggests that the rate of human learning and development is most rapid in the first five years of life. Secondly, the interventions should assist parents and siblings to deal with feelings of stress or helplessness, while learning to maintain a positive attitude. Lastly, early intervention services increases the child’s developmental, educational and social gains which increases his or her eligibility for future social and economic independence. This is in agreement with the Convention on the Rights of the Child (CRC) of 1989 which spells out the basic human rights that children everywhere have: the right to survival, to develop to the fullest capacity in their natural environment with their family, to protection from harmful influences, abuse, exploitation and to participate fully in family, cultural and social life. This right could be achieved through early intervention for children with developmental disabilities including autism. The millennium development goal number two requires that all countries should achieve universal primary education for all. This can be made possible through autism
specific early identification and intervention programme which is lacking in Kenya. This study seeks to document some of the characteristics of children with autism and strategies used in early intervention and recommend how parents can work with professionals to achieve this noble goal. Early intervention bridges the gap between early diagnosis and appropriate educational placement (Shields, 2001).

In recognition of the importance of involving parents in early intervention, the National Autistic Society (NAS) in Britain developed an autism-specific three-month parent training called Early Bird Programme in 1994 which has continuously undergone changes due to research to make it child friendly. This training programme emphasised on partnership with parents by training them to work with their children at home (Shields, 2001). Early Bird later changed its name to EarlyBird Plus Programme which is a more child friendly home based early intervention programme (Stevens and Shield 2013). A similar home-based programme called Son-Rise was started in America in 1974 has yielded good results in early intervention. In this programme, the trainer uses play based method to help a child acquire play skills which are necessary for developing communication and social skills (Kaufman and Kaufman, 1995). Special educators, parents and therapists are moving away from the traditional clinical intervention to more child-friendly early intervention that follows the child’s lead in a structured play (Koegeland Lazebnik, 2004). Many researchers in early intervention views families as integral and essential partners in implementing early intervention programmes (Glenys, 2002, Kaufman et al, 1995, Koegelet al, 2004 and Shields, 2001). With appropriate early
intervention, all children diagnosed with autism improve and that without intervention, the condition of the child worsens (Koegel et al, 2004). The Autism Society of South Africa, supports this view by saying that intensive educational and behavioural interventions can have a major positive effect when started early in a child’s life (Autism South Africa, 2011).

In a study done by Gutstein (2001) which consisted of 31 children, the autism quotient was measured using Autism Diagnostic Observation Scale (ADOS), then the sample was divided into two groups, fourteen children received early intervention through a programme called Relationship Development Intervention (RDI) in which their parents were actively involved, while 17 children were not given any structured intervention. A similar study done by Gutstein (2001), reported that 70% of the children who received interventions for 16 months improved their performance in social and academic skills and were later on admitted in mainstream schools while there was not change in performance of children who did not receive interventions. This study concluded that children improved more when parents learned to participate in identification and intervention. Another study by Rebecca and Luther (2012) also reported similar improvement in behaviours and intelligence quotient of the children with autism who took part in the short term intervention for six months.

A study done in South Africa involving 32 mothers of children with autism, reported significant improvement in communication, social skills and the families’ ability to cope
with the behavioural and communication needs of the children (Gavidia-Payne and Hudson, 2002). Kaufman et al (1995) reported that their son totally outgrew symptoms of autism after long-term intensive play-based early intervention programme.

As parents become more aware of the importance of early intervention, programmes such as Mothers to Toddlers (MTT) are coming up to help young mothers to identify developmental disabilities and develop intervention programmes in conjunction with therapists to be implemented at home before school age (Taylor and Clerk, 2004). For example, a study done by Taylor et al (2004) among the Hispanic teenage mothers in the US, found out that there was 2% increase in the number of mothers taking part in Mothers to Toddlers programmes which is contributing to reduction of autism symptoms. In Kenya, mothers are increasingly seeking intervention services for children with special needs. However, most of the available services are not autism specific. Some mothers therefore opt for home schooling and are forming associations to lobby the government (Muriuki, 2014). Home based schools (HBS) are becoming popular among parents who cannot get programmes that fully meet the educational and developmental needs of their children (Wanke, 2008).

In Kenya, the disability Act of 2003 recognises the need for early identification and intervention for children with special needs as a basic right (Republic of Kenya, 2003). This right is reiterated in National Special Needs Education Policy Framework 2009 whose first objective is to enhance early identification, assessment, intervention,
placement, habilitation and rehabilitation of learners with special needs and disabilities (Republic of Kenya, 2009). The National Early Childhood Development Policy Framework of 2006 suggests that one of the benefits of investing in early years is to identify and intervene for children with special needs and disabilities early (Republic of Kenya, 2006). The disability Act of 2003 and the National Early Childhood Development Policy Framework of 2006 do not, however, stipulate the age to commence early identification and intervention. Although legislation and policies exists in Kenya, parents are not always included or considered integral part of early identification and intervention, yet they have important information needed for assessment and play significant role in interventions.

The need for intervention services have led to the increase in the number of programmes for children with special needs in the recent years. For instance, the number of programmes has increased from 1215 in the year 2003 to 1467 in 2007 (Republic of Kenya, 2009). However, most of these programmes are not autism specific and may not fully address the educational and social needs of children with autism. Involving mothers of children with autism could be a way of collaboration in early intervention for children with autism. The Special Education Professionals Kenya (SEP-K, 2014) also emphasises the need for collaboration among the parents, special educators and therapist in early intervention. To achieve this, they have published brochures explaining different disabilities and interventions and they also run early intervention consultation in which they train parents to work with their children at home. Although research has pointed out early identification and intervention has greater outcomes both for the child with autism
and the family both in the short run and in the long-run, the role of mothers in early identification and intervention has not been studied as much and many professionals do not always work closely with mothers in early intervention.

1.2. **Statement of Problem**

Autism is a developmental disability that can be remedied if it is identified early and the child put in appropriate intervention programme. However, parents often do not know how to identify and intervene for these children in early years leading to wastage of crucial time when development is rapid. In many instances, professionals do not work with parents in early identification and intervention. In Kenya, Mwendo 2014 underscored the need for collaboration between parents and professionals in interventions. If children are not identified and assisted early, they may develop secondary disabilities such as challenging behaviours which may in turn interfere with intervention. Therefore, this study investigated mothers’ involvement in early identification and intervention for children with autism.

1.3. **Purpose of the Study**

The purpose of this study was to investigate the mothers’ involvement in early identification and intervention for children with autism. The study documented how mothers are taking part in early identification and intervention for children with autism and how they are working with other professionals to help children with autism in early years. The study is hoped to be useful to curriculum developers at the teacher and
occupational therapy training and policy making. Other stakeholders who can benefit from this study are parents and other service providers in early identification, assessment and intervention for children with autism.

1.4. Objectives of the Study

The objectives of this study were to:

1. Identify the behavioural characteristics of children with autism in Nairobi City County.
2. Establish whether mothers were aware of signs of autism before their children were diagnosed.
3. Find out the strategies used for early intervention by mothers.
4. Identify the strategies used by teachers and occupational therapists in early intervention of children with autism in Nairobi City County.
5. Find out the changes in behaviour noticed by mothers after early intervention.
6. Find out which resources mothers use for early intervention.

1.5. Research Questions

This study was guided by the following research questions:

1. What are the characteristics of autism that mothers identified in their children in Nairobi City County?
2. Were mothers aware of signs of autism before their children were diagnosed?
3. Which intervention strategies do mothers use for early intervention?
4. Which strategies do teachers and occupational therapists use for intervention in Nairobi City County?

5. What are the changes in behaviour noticed in children after early intervention?

6. Which resources do mothers use for early intervention?

1.6. Significance of the Study

The study sought to provide information on early identification and intervention for children with autism and how mothers can be involved in this process. This study is significant to special and early childhood educators since it may give them vital information needed for early identification and intervention for children with autism. The study may equally be significant to parents since it may give them information on characteristics they can use to identify children with autism. The study may also be significant to policy makers in the Ministry of Education since it may provide vital information on early intervention which might be used for planning and policy making. It may also be significant to the curriculum developers at the Kenya Institute of Curriculum Development (KICD) when preparing curriculum in early identification and intervention for children with autism. Likewise, the universities may find the study useful when designing teacher-training manuals for students at preschool and primary school levels. The study may also be significant to medical practitioners for identification and designing appropriate intervention strategies for children with autism.
1.7. Scope and Limitation of the Study

1.7.1. Scope of the Study

This study was done in Nairobi City County due to its proximity to the researchers work station. Ten schools, two Mothers-to-Toddlers (MTT) programmes and five Home-Based-Schools (HBS) catering for children with autism were chosen for the study. The respondents were mothers of children with autism, teachers and occupational therapists who were randomly chosen from the schools, MTT and HBS.

1.7.2. Limitations of the Study

The first limitation of this study was that the data was collected among parents, teachers and occupational therapists mostly in slum schools and home based programmes and cannot be generalised for the whole country. The second limitation is that the researcher mainly focused on the younger children therefore the findings cannot be generalised to the older children and adults due to behavioural differences.

1.8. Assumptions of the Study

This study assumed that children with autism can be identified and assisted early to reduce the effects of autism. The study also assumed that the respondents gave honest information when filling questionnaires and in the interviews.
1.9. **Theoretical Framework**

This study was guided by the theory of Social Constructivism forwarded by Vygotsky in 1978. This theory maintains that "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals." (Vygotsky, 1978:57). This theory was important in early intervention for children with autism since it views learning as an active process where the child actively interacts with the environment in the process of learning. An adult; the mother, therapist and a teacher in this case, are seen as facilitators of the learning process and not a master in early years (Davidson, 1981). This means that the adult should actively participate in intervention and make it fun for the child to enjoy the learning process. Children with autism would enjoy learning if it is well structured, fun and with appropriate communication.

1.10. **Conceptual clarification for understanding mothers’ involvement in early identification and intervention for children with autism**

Early identification and intervention is guided by the behavioural characteristics children presents in early years and the age at which the characteristics are first observed. The outcomes of early intervention were influenced by the type of interventions which will either be Behavioural or Biomedical interventions. Examples of behavioural include structured play and behaviour modification while biomedical interventions include
occupational therapy, speech therapy and dietary intervention. Expected outcome of early intervention included reduction of symptoms of autism such as improvement in communication, social, cognitive and living skills and the family’s ability to cope with the needs of the child.

Figure 1.0 Conceptual framework

Outcomes of mothers’ participation in early identification and intervention for children with autism
1.12 Operational Terms

**American Psychological Association (APA):** is a scientific and professional organization that represents psychologists in the United States of America and Canada.

**Applied Behaviour Analysis (ABA):** This is an approach used to modify behaviour of children with developmental disabilities and training them in social skills, communication and behaviour modification. It is based on reward system to bring about behaviour change.

**Asperger's Syndrome (AS):** A type of autism disorder that is manifested by impairments in social understanding, flexibility of thought and behaviour and comprehension skills and does not normally affect speech.

**Autistic Spectrum Disorder (ASD):** A group of neuro-developmental impairments comprising of autism, rett's disorder, childhood disintegrative disorder, Asperger’s syndrome and pervasive developmental disorder. This term is used interchangeably with autism.

**Developmental Delay:** Failure to achieve milestones such as sitting, crawling, walking and speech in time.

**Diagnosis:** Finding out the condition that a person has. It can either be educational or medical. Educational uses educational evaluation while medical requires laboratory tests and clinical observations.

**The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5):** this is the revised manual for international classification of mental disorders; it was enacted in May 2014 as a revised edition from DSM-IV published by American Psychological Association (APA)

**Early Bird Programme:** Intensive early intervention programme used in the United Kingdom by Autistic National Society (NAS)
**Home Based Schools (HBS):** Home schooling programme where children are taught at home either on full or half day.

**Mother:** Refers to a female parent with a child with autism.

**Mothers-to-Toddlers Programme (MTT):** Early intervention programme run by mothers of children with developmental disabilities.

**Neuro-cognitive disability:** Impairment of nervous system and information processing.

**Risk factors:** Things that predisposes a person to developing a disability if early remediation is not done or if conditions allow.

**Social Understanding:** Understanding of relationships, emotions and rules and regulations.
CHAPTER TWO
LITERATURE REVIEW

2.0. Introduction

This chapter reviewed related literature in line with the purpose of the study. The first part of this chapter looked at the importance of early identification and intervention, causes, prevalence, criteria for assessment and educational implication of autism. The second part looked at the literature in line with the research objectives under the following titles: characteristics, intervention strategies used by parents, teachers and occupational therapists, outcomes of early intervention, the level of awareness of autism and the resources used for early intervention.

2.1. The importance of early identification and intervention

Early identification refers to evaluation of children who are suspected to have a condition that may lead to delay in communication, physical, cognitive, sensory, social or emotional development (Bailey, 2008). Early intervention starts by observation from parents, siblings, paediatricians and educators among other persons who are in contact with the child. Early intervention refers to the services given to children at risk and those with developmental delay and disabilities to help them achieve their milestones (Bailey, 2008 and Baron-Cohen, 2004). These services should begin immediately a child is identified whether at birth or in early years. They should target the child and the entire family unit.
Early intervention starts by finding the specific ways to help a child become as functional as possible (Corsello, 2005 and Baron-Cohen, 2004). It should enable a child to reach developmental milestones on target or close to target. In other words, early intervention can sometimes help a child catch up with peers, learn coping skills and help the family respond positively to the needs of the child (Baron-Cohen, 2004). It reduces the risk of developing a handicapping condition or other special needs that may affect the child’s development.

Early intervention can be remedial or preventive in nature (Corsello, 2005). Remedial services aim at helping the child to make progress; cope with the challenges imposed by the condition and reduce the effects of the disability. Remedial services may also help the parents cope with the child’s needs such as therapies, dietary requirements and behaviour management (Corsello, 2005). Preventative intervention focuses on preventing the development of a disability on a child who is at risk. It may focus on the child alone or on the child and the family unit. According to Mortimer, Hover and Ogden (2005), early intervention programs may be centre-based, school-based, home-based, hospital-based, or a combination. Services range from identification at hospital, school screening and referral services to diagnostic and direct intervention programs. Early intervention may begin at any time between birth and school age.

In Kenya, most children are identified at school age by teachers or medical doctors when children seem not to be achieving their developmental milestones. Early Intervention
should ideally begin as early as possible when development is rapid and before the child acquires secondary disabilities and this will, in most cases, be before school age for children with autism (Mortimer, Hover and Ogden, 2005). This is equally recognised in the National Early Childhood Development Policy Framework in Kenya (Republic of Kenya, 2006), however, its implementation has not been forthcoming.

2.2. Causes of Autism

Several research studies show that autism is caused by both genetic and environmental risk factors which either work individually or in combination (McPartland, Law and Dawson, 2016). Researchers have identified a number of genes associated with Autism (Bailey, Couteur, Gottesman, Bolton, Simmonoff, Yuzda and Rutter, 1995). In a study involving 27 pairs of identical twins in Britain, Bailey et al, (1995) found 60% resemblance in the characteristics of sampled children which could be identified before the age of three. The study concluded that there was a strong genetic link in autism and therefore early identification was possible before the third birth day. Mortimer et al (2005) further reported several cases of families having more than one child with autism making hereditary a leading factor to be studied. Twin and family studies strongly suggest that some people have a genetic predisposition to autism.

The British National Autism Society (2006) reported that identical twin studies show that if one twin is affected, there is a 90% chance the other twin will be affected. There are a number of studies in progress to determine the specific genetic factors associated with the
development of autism (National Autism Society, 2006). In families with one child with ASD, the risk of having a second child with the disorder is approximately 5%.

Other studies of people with autism have found irregularities in several regions of the brain suggesting that autism could be caused by faulty neurological development (Bailey et al, 1995). For example, people with autism have been found with bigger head circumference and less developed frontal lobe, corpus callosum and amygdala. Due to such abnormal neurological and organic development, people with autism process information differently. A study by Mostafa and AL-Ayadhi (2011) found abnormal levels of serotonin in the brain of 50 children with autism they studied, this study which supports the earlier research in neurological differences and its finding is important in identification and intervention for children with autism. If parents work closely with doctors they may identify such conditions and design early intervention before the child develops fully blown autism. Other factors under study are food allergies, yeast reactions, gastrointestinal defects and intoxication by heavy chemicals such as mercury and lead (Holford and Colson, 2003). Studies in food allergies seem to point fingers to gluten and casein reaction as potential triggers of autism (Holford et al, 2003).

A study by Brain Bio Centre found elevated levels of casein and gluten in urine of a big number of people with autism (Holford, 2004). Removal of food rich in gluten and casein has shown remarkable improvement of autistic tendencies in children. High levels of gluten and casein reduces the body’s ability to absorb certain nutrients such as omega 3,
zinc, vitamins D and B complex (Holford, 2004). Supplementation of these nutrients and minerals has been found to improve sleep patterns, reduce hyperactivity and help children focus more.

2.3. **Prevalence of Autism**

Several studies have reported that there has been an increase in the prevalence of autism over the years (McPartland et al, 2016). When autism was first reported, the prevalence was estimated to be 4.5 in every 10,000 live births (Weintraub, 2011) this has increased to the current estimate of 1 in every 68 live births (McPartland et al, 2016). The Centre for Disease Control (CDC) and Prevention has been monitoring the prevalence of autism over the past two decades and found out that there has been a steady increase in the number of children being diagnosed with autism. For example, in 2007, they reported a prevalence of 1 child in every 150 while in 2014 they reported a prevalence of 1 in 96 (Centre for Disease Control and Prevention, 2014).

Boys are four times more likely to be diagnosed with autism than girls although there has been no clear explanation in this discrepancy in distribution of autism by gender (Glenys, 2002). The distribution ration was found to be four boys to one girl, which may be attributed to factors that increase the risk among boys, or, factors that protect girls such as genetic differences (Szlavits, 2013). There is, however, no published research in prevalence of autism in Kenya. Special needs teachers, educational assessment teachers and therapists have however, reported an increase in the number of children being
identified with autism leading to some schools developing autism specific units to cater for children with autism. Identification would be easier if parents were more informed and took part in identification and intervention in early years.

2.4. Criteria for assessment of autism in early years

There are no medical tests that can be performed to indicate the presence of autism. Professionals rely on behavioural characteristics to make a diagnosis (Skuse, Mandy and Scourfield, 2005). Since professionals rely on observable signs, parents may find it difficult to identify children with autism if they are not aware of such signs. A positive diagnosis of autism indicates that qualitative impairments exist in the following three areas: communication, socialisation and restricted behaviour in a range of interests and activities.

Corsello (2005) suggests that diagnosis of autism should be done at a two-stage process. The first stage involves screening using developmental checklist to find out if the child has other developmental deviations. After developmental screening, several assessment instruments are used to gather information about a child’s social skills, communication ability, behaviours and sensory development. Among them are the Checklist of Autism in Toddlers (CHAT), the Screening Tool for Autism in Two-Year-Olds (STAT), and the Social Communication Questionnaire (SCQ) for children above four years of age, Gilliam Autism Rating Scale (GARS), Autism Diagnostic Observation Schedule (ADOS) and Childhood Autism Rating Scale (CARS) among others. These assessment tools were
based on the Diagnostic and Statistical Manual of Mental Disorders 4th edition (DSM-iv) criteria for autism (Skuse et al 2005). However, since the DSM-iv was revised, all the assessment tools are expected to use the revised edition of DSM. Evaluation for autism should be done by multidisciplinary team consisting of educational psychologist, occupational therapists, paediatrician, educators and parents (Glenys, 2002). Parents are therefore the integral part of the process of identification. This is one area that is lacking in many cases in Kenya.

2.5. Educational Implication of Autism

Characteristics of autism present a number of challenges to teachers (Glenys, 2002). Children with severe autism may not fully benefit from mainstream education thereby being catered for in special schools. Impairments in communication, for instance, make it difficult for children with autism to follow instructions, communicate their needs and socialise with their peers (Glenys, 2002). This may also limit the child’s progress in literacy and other academic subjects.

Scott and Gillis (2010) observe that difficulty with social interaction may impair normal learning if it is not addressed early. They recommend that play based therapy should be used to train in social skills. Difficulty in social skills ranges from difficulty with following class rules, playing with peers to making friends. Glenys (2002) says that difficulty with social understanding is made worse with inflexibility. Children with
autism may therefore require definite structures in classroom and playground for them to function well.

Difficulty in sensory modulation may make it difficult for a child to settle in a noisy or overcrowded classroom. Some children experience sensory overload and switch off or throw tantrum as a coping mechanism (Cranowitz and Miller, 2006). Noisy playground with a lot of unpredictable activities makes them feel unsafe and uncomfortable. Cranowitz et al (2006) suggests that classroom and playground should be structured to reduce effect of noise and physical distraction.

Educational programs for children with autism should focus on improving communication, social, academic, behavioural, and daily living skills (Glenys, 2002). Behaviour and communication problems that interfere with learning sometimes require the assistance of a knowledgeable professional in the autism field who develops and helps to implement a plan which can be carried out at home and in school. The classroom environment should be structured so that the program is consistent and predictable (Scott et al, 2010). Children with autism learn better and are less confused when information is presented visually as well as verbally. Structured teaching requires physical organisation of the learning environment, individualised schedules to show the sequence of daily activities, activity systems to promote the development of independence in various areas of the individual’s life and visually-based presentation of instructional materials and learning activities (Mesibov, Shea and Schopler, 2005). This kind of physical
organisation reduces chances of children exhibiting challenging behaviour and improves their organisation skills.


Autism was first described by Leo Kanner in 1943, in an article that reported case studies of eleven children who had significant impairments in speech, social skills and had compulsive and ritualistic behaviours which begun before the age of three (Corsello, 2005). Since autism was first described, the diagnostic criteria has evolved based on continued observations and research, resulting to the current criteria outlined in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) which sets international standard for classification of mental disorders (APA, 2014). Presently, autistic disorder is defined in terms of impairments in social interaction, communication, restricted interests, repetitive and stereotyped patterns of behaviours occurring before the age of 3 years and affecting more boys than girls at the ration of 4:1 (Corsello, 2005).

A study on awareness of autism among health care providers, parents and other professionals reported that although the level of awareness is increasing, a lot still need to be done (Bashir, Khurshid and Qadri, 2014). The study noted that awareness of the symptoms and diagnostic criteria for autism is important starting point for intervention.

Among the first characteristics to be noticed in children with autism by many parents and teachers is the impairment in communication skills (Baron-Cohen, 2004). Speech and language challenges are of central importance in the diagnosis of autism. Many children
with autism are initially referred for assessment because of parents’ concerns about delayed language milestones (Inge-Marie, Ashley, Jillian and Elizabeth, 2011). Language impairments essentially cut across all the individuals with autism although 50% of the affected individuals never acquire functional speech (Prizant, 1996). As interventions improve, a study in 2005 found a decrease in proportion of non-verbal individuals; typically 25% to 40% of children with autism (Tager-Flusberg, Paul, and Lord, 2005).

Glenys (2002) observes that most children with autism delay significantly in developing both receptive and expressive language. Some children with autism may not develop speech, while those who develop still exhibit qualitative impairments in communication ranging from poor semantics to difficulty with vocal quality modulation (Glenys, 2002). The British National Autistic Society, (2003) explains that children with autism experience challenges in both verbal and nonverbal communication. Some children may have repetitive speech (such as repeating words they heard from the television or even people around him/her), vocal stimulation and difficulty with understanding facial expressions.

Some children with autism acquire language at the right age but they experience challenges with pragmatics. Approximately 76% of children with Aspergers Syndrome and 31% of the high functioning autism have problems with pragmatics which affects their social communication (Tager-Flusberg et al, 2011). Some of the common characteristics observed include echolalia, repeating phrases and talking of what they find interesting without paying attention to social communication around them.
Lack of social understanding which impairs the child’s ability to relate and play well with their peers and adults has been cited as one of the characteristics used in identification of autism (Mortimer et al, 2005). This difficulty may extend to an inability to distil social information from social interaction and engage in meaningful play skills with peers. Mortimer et al (2005) explains that individuals with autism have significant difficulty with any interaction that requires knowledge of other people and what they think or know. Baron-Cohen (2004) theorised that people with autism have a social cognitive deficit in understanding interpersonal relationships. Baron-Cohen (2004) has described this as the “lack of theory of mind”. He explains that children with autism do not have empathy and fails to read other people’s feelings and intentions. Lack of theory of mind or mind blindness according to Baron-Cohen (2004) interferes with their ability to develop appropriate socio-emotional skills.

A significant number of children with autism exhibit stereotyped and ritualistic behaviours (Milshtein, Yirmiya, Oppenheim, Koren-Karie and Levi, 2009). Ritualistic behaviours are repetitive behaviours, often occurring with high frequency, invariant in pattern and non-functional (Whitman, 2004). About 68% to 74% of children with autism have been found to exhibit ritualistic activities at varying severity depending on the cognitive functioning level of the child (Whitman, 2004). Some of the ritualistic behaviours include flapping hands, rocking forth and backwards, spinning objects not designed for spinning, walking tiptoes, arranging and banging toys. A study by Hsu (2009) reported that 92% of children with autism have problem with following rules and taking turns in play and other activities that required flexibility. This presents challenges
in the learning environment and in therapy sessions since children are expected to follow rules and regulations. Hsu (2009) agrees with Whitman (2004) that the level of stereotyped behaviour depends on severity of autism and the level of cognitive function. In contrast, Whitman (2004) reported that stereotyped behaviours like flapping hands and rocking are purposeless while Hsu (2009) found the rituals to serve a purpose and they are exhibited differently in different environments and also controlled by the child’s emotions. For example, rigidity was found in 9.9% of children with mild autism, 24.6% of those with difficulty and 42.3% of children with severe autism.

Gut related issues such as poor digestion, stomach crumps, leaky gut and chronic diarrhoea has been reported in many children with autism. For example, a study by Horvath and Perman (2002) found that 76% of children with autism had Gastro Intestinal (GI) distress which persisted until adulthood compared to 30% of the healthy siblings. The research also reported that 48% of children with autism delayed significantly in toilet training, and they were not fully toilet trained by 4 years compared to 2% of their typical siblings. Another research by Doherty (2013) found that 90% of children with autism had a problem with intestinal flora and problem with digestion which are linked to the GI distress described earlier by Horvath et al (2002). These conditions range in severity from a tendency for chronic constipation or diarrhoea to inflammatory bowel disease. Pain caused by GI issues can prompt behavioural changes such as increased rocking, head banging and outbursts of aggression or self-injury.
A study by Doherty (2013) found a significant number of children with autism with different seizure disorders, including epilepsy. Doherty (2013) reported that at least 39% of children and adults with autism experience some form of seizures. Seizures are more common in people with autism who also have intellectual disability than those without. Someone with autism may experience more than one type of seizure, such as, the grand mal, petit mal and subclinical seizure, which may be detected only with electroencephalogram (EEG) testing. Seizures associated with autism tend to start in either early childhood or adolescence. But they may occur at any time.

Redlich (2010) observed that other commonly ignored yet important characteristic of children with autism include difficulty with motor coordination. These difficulties may be characterised by poor motor planning, decreased balance, bilateral coordination, postural control and gradation of movement. Some children, especially those who have been diagnosed with Asperger’s syndrome tend to have low muscle tone which affects their ability to perform activities such as climbing stairs, carrying weighty materials and handwriting (Mortimer et al, 2005). Such may be described as clumsy because they often spill things, write with light handwriting; tend to give up on vigorous activities and generally appear lazy (Redlich, 2010).

Other characteristics commonly exhibited by children with autism include impairments in sensory modulation (Cranowitz and Miller, 2006). Sensory modulation impairment may range from hypersensitivity to hyposensitivity to certain sensory stimuli such as sound, touch and smell (Mortimer et al, 2005). A child who is hypersensitive to high pitched
sounds may close his ears or cry when someone shouts while a child who is hyposensitive to touch may crave for hugging and squeezing people. Some children may have tactile hypersensitivity and refuse a hug, shaking hands and other close contact. They may also refuse to wear certain types of clothes. Other sensory integration difficulty that has been observed include; sensitivity to certain smell, taste of food, temperature and vestibule sensitivity.

Children with autism have also been found to have erratic sleep patterns and sleep disorders. Doherty (2013) reported that about 83% of children with autism have sleep disorders due to low level of serotonin, dopamine, GABA, glutamate and norepinephrine which are neurotransmitters that regulate sleep. The sleep problems include being a light sleeper, not having sleep at all, sleeping very late and waking up early. Doherty (2013) also found out that 90% of children with autism who were visiting outpatient clinic had gut problem which included flora imbalance and poor digestion. The gut problem was linked to leaky gut and resulted to autoimmune reaction and allergies in children. This study concurs with the a similar study by Horvath et al (2002) which reported that 64% of children with autism had general sleep disorders in which 41% had difficulty falling sleep, followed by frequent awakening at 34% and early morning awakening at 20%. The same research identified frequent nightmares to be affecting at least 52% of the children with autism compared to 7% of the typical siblings.

Hyperactivity has been observed in many children with autism leading to diagnosis of comorbidity with ADHD (Leyfer, Folstein, Bacalman, Davis, Dinh, Morgan, Targer-
Flusberg and Lainhart, 2006). Leyfer et al (2006) also reported that 55% of children they surveyed had significantly impairing ADHD, 31% of the children met the DSM-IV criteria for diagnosis for ADHD while 24% were diagnosed with inattention and 23% diagnosed with hyperactivity. Some children with autism may exhibit challenging behaviours ranging from tantrums, conduct oppositional defiance to aggression (Mortimer et al, 2005). Horvath et al (2002) found that 43% of children with autism had more frequent irritability compared 13% in typical children. The irritability and tantrums was linked to GI distress and sensory processing problem. Such behaviour difficulties limit their chances of participating in social activities at home and in school.

Children who exhibit severe tantrums may appear to go into a state of rage, panic, anxiety or fear for no reason at all (Corsello, 2005). Tantrums are normal behaviour for most children in early years; however, the severity and frequency of tantrums in children with autism seem to be higher than for a typically growing child. Anger and aggression has also been observed in many children with autism (Corsello, 2005). Aggression might persist throughout the childhood and sometimes in teenage if not well managed. Obsessive Compulsive Disorder has been reported (OCD) in 37% of children with autism and this may present itself both as challenging behaviour and lack of flexibility (Leyfer et al, 2006). Difficulty with following rules and directions and accepting changes was reported in 7% of children with autism in a study done by Leyfer et al (2006). This difficulty interferes with their social adjustment, makes it difficult for them to play constructively with other children and presents challenges in learning environment. A study in the USA on long-term outcomes of toddlers with autism spectrum disorders
exposed to short-term intervention found significant gains in IQ points and communication skills as well as a reduction in the symptoms of autism (Rebecca and Luther, 2012). The same study reported that the improvements were sustainable over a long period of time further confirming the importance of early identification and intervention.

2.7. **Intervention strategies used by parents of children with autism**

A good intervention programme for children with autism should involve collaboration between parents and a multidisciplinary team of professionals (Glenys, 2002). A good multidisciplinary team would consist of therapists, teachers and psychologists working together with the parents and other family members of the child with autism. Commonly used home based intervention by parents is the Intensive Home based Behaviour Intervention. A study by Luiselli, Cannon, Ellis, and Sisson (2011) found overall improvement in the areas of communication, cognitive and social-emotional functioning following a nine month intensive therapy at home. There are several intervention strategies that are used at home by parents and some are used with assistance or training from therapists and teachers.

A commonly used play-based early intervention programme that is being used by parents is Relationship Development Intervention (RDI) which begins first by helping children to bond with parents then develop relationship with others (Gutstein, 2001). This is a parent-based clinical treatment for individuals with autism spectrum and other relationship-based disorders through play. This programme is based on the model of
Experience Sharing developed by Steven Gutstein. Gutstein (2001) studied the means by which typical children develop emotional understanding and relationships before he developed RDI. The RDI Program provides a path for people on the Autism Spectrum to learn friendship, empathy and a love of sharing their world with others (Gutstein and Sheely, 2002). Language comes alive when integrated with real emotion. Gutstein et al (2002) explains that people with Autism and Asperger’s learn not only to tolerate, but to enjoy change, transition and going with the flow. It begins at the edge of each person’s current capability and carefully teaches the skills needed for competence and fulfilment in a complex world such as sharing play materials and waiting for one’s turn in play.

Another play-based intervention that may be used both in schools and at home is the Floortime intervention. Floortime is an educational model developed by child psychiatrist Stanley Greenspan (Greenspan and Wieder, 2003). Through the use of Floortime, parents and educators can help the child move up the developmental ladder by following the child’s lead and building on what the child does to encourage more interactions. Floortime does not treat the child with autism in separate pieces for speech development or motor development but rather addresses the emotional development, in contrast to other approaches which tend to focus on cognitive development. It is frequently used for a child’s daily playtime in conjunction with other methods such as Applied Behaviour Analysis (ABA) and Sensory Integration (SI) both at home and in preschools.

Spreckley and Boyd, (2009) explains that Applied Behaviour Analysis is an evidence-based, intensive education therapy for children with autism. It is proven to be effective
and is the preferred method of treatment of autism especially in the early years. It helps children develop their social, academic, self-help and behavioural skills needed to interact with others and to cope with the challenges of everyday life. ABA therapy takes the form of a highly structured program designed to meet the individual requirements of each child, while building the foundations for life-long learning (Spreckley *et al.*, 2009). ABA assumes that children are more likely to repeat behaviours or responses that are rewarded, and they are less likely to continue behaviours that are not rewarded. Eventually, the reinforcement is reduced so that the child can learn without constant rewards.

A similar intervention to the above two therapies is the Integrated Play Group developed by Wolfberg (2009). In this method, children participate in small groups organised around social pretend play activities (Wolfberg, 2009). Children pretend or act out as different characters through teacher’s assistance as they learn communication and social skills. In this approach, Wolfberg, (2009) calls children with autism the “novice players,” and their typically developing counterparts are the “expert players.” The expert players are guided by a trained adult who can monitor, interpret and build on the children’s play interests and social interaction. Parents can use this method at home by incorporating siblings in play to develop social and communication skills. Since play seems to take centre stage in interventions in early years, a mother growing intervention programme that is commonly used in early years is the Son-Rise programme that is discussed below.
Son-Rise is a home-based program for children with autism and other developmental disabilities. It was developed by parents of a boy with autism, who is claimed to have fully recovered from his condition through intensive intervention and later called the Son-Rise (Houghton, Schuchaard, Lewis, and Thompson, 2013). The programme is a parent-directed, relationship-based play therapy. The program's developers claim that by encouraging eye contact and accepting the child without judgment the treated children will teach themselves to interact with others, and this will allow them to engage in social interaction because they chose to learn the skills. However, due to the home-based nature of the program, no published independent study has tested the efficacy of the program. Houghton et al reports that Son-Rise programme can be used to train children in communication, experience happiness, have deep meaningful and caring relationships with others and develop friendship among others. Son-Rise is a full day home based therapy that involves goal directed play where initially the child leads the way then later on an adult brings in the core objectives of the play.

Holford, (2004) advises that since children with autism have a lot of food allergies, gastrointestinal disorders and other dietary needs; restructuring diet and supplementing deficient nutrients may improve their condition. Research by Brain Bio-centre (Holford, 2004) found out that balancing children’s blood sugar by reducing their intake of sugar and supplementing omega 3, vitamins B complex, Vitamins D and A reduced hyperactivity significantly.
Although autism cannot be cured medically, doctors may prescribe medication to reduce hyperactivity, self-injurious behaviours, allergies and other medical conditions that may occur with autism. There is no medication that has been developed to correct the repetitive behaviour, communication or social challenges that make up the core deficits of autism (Ackerman, 2011). Scientists have found, however, that medicines developed to treat other disorders with similar symptoms such as Attention Deficit Disorders (ADHD), anxiety and depression are sometimes effective in treating the same symptoms in children with autism. Ackerman, (2011) suggests that associated medical difficulties which occur with autism such as epilepsy and gastrointestinal disorders should be treated medically. There are other nonconventional methods that are being used such as pet therapy, homeopathy and step therapy as explained below.

Pet therapy has been used to reduce phobias and train children with autism social and communication skills (Siewertsen, French and Teramoto, 2015). Although scientific evidence is still lacking, many parents and professionals have made claims that children with autism have made progress in different areas from pet therapy (Siewertsen et al, 2015). Commonly used pets are horses and dogs although other pets could be used (O’Haire, 2013).

2.8. Strategies used by teachers and occupation therapists

Teachers and occupational therapists share a lot of intervention strategies. However, there are certain strategies that are either specific to the teachers while there are those that are specific to the occupational therapists.
Since children with autism respond well to routines and structures, structured teaching has been developed to respond to this need. Commonly used structured teaching method which was developed by Erick Schopler in the early 1970s has gained a lot of recognition in both homes and institutions for individualised and group therapy. The Treatment and Education of Autistic and Communication Handicapped Children (TEACCH) is a structured teaching method that combines visual structures and social structures to bring order in teaching children with autism (Bryson, Rogers, and Fombonne, 2003). Visual structures comprises of visual layout of class room with clear passage, storage area, play area and visual timetable. Social structures include rules and expectations and well developed means of communication using pictures (Jordan, 2002). Children are taught to follow structures and any change is communicated early. Activities are monitored using visual timers and children are taught to stick to the routine. An advantage of TEACCH is that it can be used by children with autism in special and inclusive classroom, home schooling and therapy centres. Structures helps to control challenging behaviours, reduce disruptiveness and lead to smooth transition (Jordan, 2002).

Applied Behaviour Analysis (ABA) is another technique used in early intervention for children with autism with principals that may be borrowed and be used by both the occupational therapists and teachers. It is based on the principle that influencing a response associated with a particular behaviour may cause that behaviour to be shaped and controlled (Martinez-Diaz, 2000). ABA is a mixture of psychological and educational techniques that are tailored to the needs of each individual child to alter their behaviours. ABA involves the use of behavioural methods to measure behaviour, teach
functional skills, and evaluate progress. Martinez-Diaz (2000) explains that ABA starts
with "discrete trials" therapy. A discrete trial consists of a therapist asking a child to do
something like keeping a toy. If the child complies, he is given a "reinforcer" or reward in
the form of a tiny food treat or other reward. If the child does not comply, he does not
receive the reward, and the trial is repeated.

To address communication needs of children with autism, Picture Exchange
Communication System (PECS) was developed. This is a form of augmentative
communication that is designed to teach functional communication with an initial focus
on spontaneity by exchanging pictures by what the child wants (Tincani, and Devis,
2010). PECS does not require complex or expensive materials since it uses picture
symbols as the modality. Research by the Delaware Autistic Program has shown that
many pre-schoolers using PECS also begin developing speech after using it for some
time (Tincani et al., 2010). This could be due to continuous exposure to language during
training.

Since some children with autism experiences challenges in auditory processing, Auditory
Integrated Training (AIT) was developed to improve their ability to process language
(Thomas, 2011). AIT aims at addressing the sensory problems such as hearing distortions
and oversensitive hearing, which are said to cause discomfort and confusion in children
with autism. Thomas (2011) explains that these hypersensitivities are believed to interfere
with a child’s attention, comprehension, and ability to learn. The training typically
involves the child attending two 30-minute sessions per day, separated by a minimum of
three hours, for ten consecutive working days. The child listens via headphones to a series of specially filtered and modulated music with wide frequency range.

Sensory Integration (SI) therapy which was developed by Dr Jean Ayers in 1972 and it is used to develop sensory modulation ability in children who experiences sensory integration difficulty. This therapy initially incorporated the vestibular, proprioceptive and tactile systems. It has currently been developed to incorporate other senses such as auditory, olfactory, gustatory and kinaesthetic (Eide, 2003). This input facilitates the development of the nervous system. It is through the familiar sensory systems of touch, sight, smell, taste, and hearing that people receive input and information about our world. Sensory integration is most commonly used by Occupational therapists, speech and language therapists, physiotherapists and special educators to help children with autism in early years.

Special needs teachers and occupational therapists work closely with speech therapists to improve communication skills (Lubinski, 2010). The role of speech therapists when working with children with autism stretches beyond communication to other services like prevention of secondary language difficulties, screening, treatment, management (Lubinski, 2010).

2.9. Outcomes of early intervention

A child's prognosis after an early identification on autism depends on a number of different factors. The severity of the symptoms can vary greatly from one end of the
spectrum to the other, with some children being mildly affected and others profoundly affected. Research has found that young children with autism can benefit greatly from early intervention services (Estes, Munson, Rogers, Greenson, Winter, and Dawson (2015). Estes et al asserts that early intervention for toddlers with autism spectrum disorder helps improve their intellectual ability and reduces autism symptoms years after originally getting treatment. The research also found significant improvement in social interaction and communication skills among children who took part in early intervention. A study by Bashir, Khurshid and Qadri (2014) reported that early intervention helped to reduce stress from the family as well as improving the siblings and parent’s coping index. Dillenburger, Jordan, McKerr, Devine and Keenan (2013) reported that at least a third of children with autism outgrew the symptoms of autism and could not meet the diagnosis by the age of nine. Other than the individual and family benefits of early intervention, it is clear that the government saves resources in the long run by offering appropriate early intervention and involving parents in the whole process. Dillenburger et al also found that children who had good early intervention registered better grades in the school and 15% of them entered competitive job market in future.

2.10. Level of awareness of autism among parents

The level of awareness of autism among parents and professionals has been increasing slowly over the years (Bashir et al, 2014). Bashir et al explains that the level of awareness can greatly improve accessibility to service provision in early years, however, he points out that a number of factors such as family belief system, level of education and
financial ability affected the level of awareness of autism. In a study by Hock, McKeever, McKeever and Yu, (2015) found out that the level of awareness of autism varied across the world, with developed countries having more awareness because of the presence of autism organisations like Autism Speaks and CDC which disseminates information to parents and professionals.

Although there is no accurate statistics on the level of awareness of autism across the world, a survey by Dillenburger et al, established that some countries had higher level of awareness like France had 100%, United Kingdom and the United States of America had 60% to 80% level of awareness of autism respectively. There is lack of statistics from developing countries, Kenya included. Research by Bashir et al and Hock et al agrees that the level of development, education and presence of awareness organisations greatly improved parents’ awareness and access to intervention services. Hock et al also asserts that the level of awareness of autism reduces parental stress and increases their ability to cope with the needs of their children as well as helping them to make the right choices for interventions and resources needed for interventions.

2.11. Resources used for early intervention

Parents and professionals working with children with autism use different intervention strategies to help their children in early years. Amongst the factors that determine the services provided include availability of the services, resources, parent’s financial ability and the severity of the condition the child has. Bellini, Hume, and Pratt, (2006) identified
some of the services that parents seek for their children in India as Speech Therapy, Occupational Therapy, Classroom Aide, Consultation, Augmentative Communication, Sensory Integration, Behaviour Supports, Physical Therapy, Medical Treatment, Applied Behavior Analysis (ABA), Music Therapy, Psychotherapy, Parent Training, Floortime, Social Skills Training and Recreational Therapy among others. These services use different resources to train children different skills ranging from communication, social interaction, and motor coordination to activities of daily living. Occupational therapy services have been found to be important in improving the child’s ability to socialise, learn activities of daily living and motor skills (Duncan, 2012).

Model Me Kidsare made up of short video clips that help children to learn by copying other children’s behaviour at school, on a play-date, at a birthday party, on the playground, in the library, at the dentist, eating joints and other places. Another great resource identified by Autism Now (2015) is Go-Talk Pocket which is a lightweight gadget that is easy to use by younger children with autism for communication and can be carried easily in the pocket. My-Voice is an alternative and augmentative communications aide (AAC) designed to help non-verbal, low cognitive children with autism to communicate their needs easily. It was designed from picture board and talks when a child touches the picture on the board (Autism Speaks, 2015). Proloquo2Go is new software that was designed to help children with autism and communication disorders to communicate a wide range of needs and engage in social communication since it allows parents and children to add photos, change voices and make sentence using pictures or by
typing on it. It has default 7000 items and can be used in iPhone and iPod touch and tablets easily. A variety of timers such as sand timers, talking-timers and ball-on-thread activity timers are used when playing and doing other cognitive activities.

Visual schedules such as visual timetables, golden rules, sticker charts and activity charts are used to communicate transition and activities that are going on. Jigsaw puzzles and building blocks are also common in schools, at home and in many therapy centres. They help to improve eye-hand coordination and general concentration and well as improving cognitive processing. Cush-balls, stress balls and bouncing balls are used to help children manage anxiety, stress and to control ritualistic behaviours. Children with tactile sensitivity use a variety of resources such as squeezing machine, weighted jacket and vests to help ease pressure (Grandin, 2015). Assorted toys are used to train children in variety of play activities. Teachers also use Tiggly Shapes, Reading Comprehension Cubes and flash cards to train children different academic skills like shapes, basic reading comprehension, spelling and colours among others while those who do Floortime therapy use assorted toys and dolls when training children in variety of play skills (Ross and Littleton, 2012).

2.12. Conclusion

Existing literature shows that collaboration with parents in early identification and intervention may be possible if parents are given training as has been done in some countries. Since autism presents its characteristics early in life, training mothers in early
identification may make it easy for children to be identified and helped early. In the UK and US, as shown in the literature, parent support groups disseminate information that may be used for identification and intervention. In South Africa, Namibia and Botswana, similar parent support groups help in identification and creation of awareness to the public. In Kenya, the Autism Society, SEP-K and Autism Awareness Kenya disseminate information and trains professionals in early identification and intervention.

Early identification and intervention for children with autism has been found to have greater outcomes in stimulating development in early years. When a child is identified early and placed on a proper intervention, the family too benefits since they will be able to meet the needs of the child, family stress goes down, by extension and the family saves money that would have been used in long-term therapy. If early identification and intervention is not done, the characteristics of autism can have negative impact in education, social inclusion and work adjustments in adulthood. It is therefore important to involve parents, especially mothers in this process to improve collaboration with professionals for the benefit of the child. This is in line with the Special Education Act of 2003 and the National Early Childhood Development Policy Framework of 2006 which has remained just in papers.

In line with the above literature, this research sought to find out how mothers are involved in early identification and intervention, and how they work with other
professionals in this process. The next chapter explains the methodology that was used in the study which is in line with the purpose and the objectives of the study.
CHAPTER THREE
RESEARCH METHODOLOGY

3.0. Introduction

This chapter focussed on the research design employed, study population, variables, the study locale, instruments, piloting, data collection procedures data analysis and logistical and ethical considerations.

3.1. Research Design

This study adopted a survey research design. It was most suited for the study because this design allowed the use of both qualitative and quantitative data. As explained by Robson (2004) qualitative data is necessary in describing characteristics of a phenomena such as the characteristics of autism, while quantitative data is needed to analyse the statistical quality of the phenomena such as the frequency of the characteristics of autism in children and the ages at which different symptoms occur. The researcher was interested in describing the signs that mothers observed in their children and how interventions were done at home and in the schools. This was made possible by using qualitative data. The study adopted a cross sectional survey. As explained by Babbie (2003), a cross sectional survey is preferred when gathering information on a population at a single point of time. This was preferred for this study because it enabled the researcher to gather information on early identification and intervention at one time.
3.2. **Study Population**

The study population were mothers of children with autism, teachers and occupational therapists. They were sampled from schools, mothers-to-toddlers programmes (MTT) and home-based-schools (HBS). Purposive sampling was used to get the target population sample for the study. Since the study focused on early intervention, only mothers, teachers and occupational therapists of children who were receiving early intervention were included while those of older children were excluded purposively from the study.

3.3. **Variables**

Mugenda and Mugenda (2003) defined variable as a measurable characteristic that takes different values among the subjects which makes it a reasonable way of stating a particular quality in a subject. Independent Variables in this research were: behavioural characteristics of the children observed and the age at which the child was identified and diagnosed with autism. The intervening variables were divided into two categories of early intervention namely, Biomedical Interventions with examples like occupational therapy, speech therapy and dietary intervention; and Behavioural Interventions like structured play and behaviour modification. The dependent variables were the outcomes of intervention such as improvement in communication, social, cognitive and living skills, and the family’s ability to cope with the needs of the child.
3.4. **Location of the study**

This study was done in Nairobi County. The study was done in ten schools, two Mothers-to-Toddlers programmes and two Home-Based-Schools that cater for children with autism.

3.5. **Target population**

The target population was 312 respondents which comprised of 271 mothers of children with autism, 29 teachers and 12 therapists as shown in tables 3.1, 3.2 and 3.3.

**Table 3.1. Target population: From Schools**

<table>
<thead>
<tr>
<th>Programme</th>
<th>Mothers</th>
<th>Teachers</th>
<th>Therapists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Peter’s School</td>
<td>32</td>
<td>3</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>Kestrel Manor School</td>
<td>25</td>
<td>5</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>Little Rock</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Toy Primary</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Jacaranda Special School</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Buruburu Baptist School</td>
<td>12</td>
<td>2</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Mathare Special School</td>
<td>10</td>
<td>2</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>City Primary School</td>
<td>74</td>
<td>5</td>
<td>2</td>
<td>81</td>
</tr>
<tr>
<td>Oshwal Academy</td>
<td>9</td>
<td>2</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Nile Road Special school</td>
<td>18</td>
<td>2</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>215</td>
<td>27</td>
<td>8</td>
<td>250</td>
</tr>
</tbody>
</table>
Table 3.2. Target population: From Mothers to Toddlers Programme

<table>
<thead>
<tr>
<th>Programme</th>
<th>Mothers</th>
<th>Therapists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bright Star Mothers to Toddlers Programme</td>
<td>27</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>Spring Valley Mothers to Toddlers Programme</td>
<td>19</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>2</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

Table 3.3. Target population: From Home Based Schools

<table>
<thead>
<tr>
<th>Programme</th>
<th>Mothers</th>
<th>Teachers</th>
<th>Therapists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Home Schooling Programmes</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

3.6. Sample size

The sample size was calculated using the Cochran’s (1977) formula. This gives a sample size of 172 respondents as calculated below.

\[
n^1 = \frac{n_o}{1 + n_o/N}
\]

\[n^1\] required sample size

\[n_o\] sample return taken to be 384

\[N\] target population

95% confidence interval

\[n^1 = \frac{384.}{1+384/312}\]

\[= 172 \text{ Respondents}\]
The sampling size was selected randomly on a 50% representation from the target population as follows:

Table 3.4  Sampling grid

<table>
<thead>
<tr>
<th>Programme</th>
<th>Mothers</th>
<th>Teachers</th>
<th>Therapists</th>
<th>Total</th>
<th>% Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>103</td>
<td>27</td>
<td>8</td>
<td>138</td>
<td>80.23%</td>
</tr>
<tr>
<td>Mothers to Toddlers</td>
<td>24</td>
<td>-</td>
<td>2</td>
<td>26</td>
<td>15.12%</td>
</tr>
<tr>
<td>Home Schooling</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>4.65%</td>
</tr>
<tr>
<td>Total</td>
<td>131</td>
<td>29</td>
<td>12</td>
<td>172</td>
<td>100%</td>
</tr>
</tbody>
</table>

3.7  Research Instruments

3.7.1  Questionnaires for mothers

Questionnaires were prepared with both open and closed ended questions to collect information from the mothers of children with autism. Open ended questions allowed respondents to give extra information while fixed or closed-ended questions were used to get definite information such as the age and gender of the child, intervention strategies used and professionals involved. As observed by Robson (2004) questionnaires are preferred when collecting data from a larger sample since they are easier to use and the researcher does not have to meet all the respondents.
3.7.2 Interview schedules for occupational therapists and teachers

Interview schedules were developed to collect information from occupational therapists and teachers who work with children with autism. The respondents were interviewed to give information on identification, intervention and how they worked with the mothers in identification and intervention. Interview schedules are good for practitioner researcher because they allow respondents to give their personal views that may be important in the study (Miller and Crabtree, 1999). The interview schedules allowed the respondents to give extra information especially on resources and challenges they experience in the course of interventions.

3.7.3 Observation Schedule for Teachers

The researcher used structured observation method to generate qualitative data on characteristics displayed by the children, intervention methods and the resources used. The observation schedules were filled in by the researcher during the observations in different intervention sessions. As observed by Robson (2003), participant observation is preferred by practitioner researchers in education because it generates rich qualitative data that may not be captured by the interview schedules and questionnaires.

3.8. Piloting of Research Instruments

Piloting was done at the Grangeville School and Spring Valley Mothers-to-Toddlers programme. These two institutions were purposively chosen because they were closer to the researcher’s work station. The two institutions were considered a better representation
of the research population since they catered for children from different social backgrounds. The respondents were asked to point out the questions that they did not understand and the questions were paraphrased to make them easier to understand.

3.8.1. Inclusion and Exclusion

Only respondents who consented to the research took part in the study. Since the researcher was collecting data in early identification and intervention for children with autism, parents, therapists and teachers of children without the diagnosis of autism were not interviewed.

3.8.2. Validity of the Research Instruments

Validity of the questionnaires and interview schedules were assured through piloting, test-retest and by seeking opinions from my supervisors and other experts and peers who were asked to comment on the validity of the research instruments. Their recommendations were incorporated into the final instruments. The respondents chosen for piloting were asked to fill in the questionnaires or to be interviewed. Questions they found ambiguous were either removed or modified. The respondents used during the piloting stage, were not used as final respondents in the study.

Validity of research deals with how accurate, correct or true the research is (Robson, 2004). Determining whether or not the findings have any value in the real world should be considered in any valuable research. Without validity, research is futile, resulting in
useless information that serves no purpose. The heart of validity lies in the methodology and methods used (Robson, 1993). Research methods lacking validity produce invalid results, regardless of how diligently the methodology is followed. There are of different types of validity. However, this research focused on two types of validity, these are, internal and external validity.

Internal validity refers to the relationship among variables, essentially whether or not a cause and effect relationship can be established (Robson, 2002). For instance, the relationship between mothers’ involvement in early intervention and the outcomes of early intervention, or the relationship between the age of a child at the time when early intervention was started and the outcomes in terms of behaviours acquired. According to Robson (2002) internal validity deals with the question of whether the results of the process being analysed is a result of the explanatory variables or are due to other reasons or process. In other words, it checks if there are different interpretations of the results within the boundaries of the research study itself (Chilton, 1999). In this survey for instance, internal validity was concerned with relationship between amount of time mothers spent with children and the acquisition of desired behaviours such as acquiring social, communication and self-help skills. It may also consider the child’s achievement in tasks after adaptation and before adaptations in the activities and facilities.

External validity on the other hand, refers to whether the study results or interpretations are likely to apply outside the immediate context of the study (Chilton, 1999). It
addresses issues related to whether the findings represent a general law, or only one
highly restricted to a specific research context. In this study, for instance, it addresses the
question as to whether the characteristics described here represent other children with
autism other than the study population. The literature should also concur with the
findings.

3.8.3. Reliability of Research Instruments

The reliability of a research instrument concerns the extent to which the instrument
yields the same results on repeated trials. The reliability of this study was done through
test-retest method. This was determined by examining consistency of the responses
between the two tests; one from the Grangeville School and the second one from Spring
Valley Mothers to Toddlers programme. The respondents were requested to give their
response again after duration of two weeks for a retest. Their responses were then
scored with reference to the intended objectives of the study. The questions that yielded
significantly different responses were removed or paraphrased to help the respondents
to understand them better. The final instruments were therefore considered more
reliable and were then used in the study.

3.9. Data collection Techniques

This study made use of questionnaires, interviews and observation schedules. Five
research assistants were recruited from a few schools where data collection was done.
The researcher thought it easier to recruit teachers who were already familiar with the
environment and the neighbouring schools to make it easier for them to access the respondents. They were then given training on how to use the interview schedules and questionnaires. The research assistants delivered questionnaires to the parents and collected them after the parents had filled them. They also helped some mothers to fill in the questionnaires upon their request. Second phase entailed interviewing teachers and therapists. The researcher interviewed a few teachers and therapists and did the observations while the research assistants interviewed the rest. Interviews were done in the schools and at Mothers-to-Toddler centres at the convenience of the respondents. Data was collected by filling in the questionnaires, interview schedules and taking personal notes from the interviews. Each interview schedule and questionnaire was coded with a number to assure participants anonymity.

3.10. Analysis of Data

This study made use of Quasi-statistical approach which enabled both statistical and descriptive data to be used. As explained by Robson, (2002), this method makes use of statistics and description. Weber (1985) states that the best content analytic studies utilise both qualitative and quantitative operations on text by including the calculation of frequencies and percentage frequencies of comments coded in each category. To do this, the study made use of sampling grid. The grid enabled the researcher to analyse statistical concepts like frequency of behaviours or characteristics observed by mothers, age ranges types of intervention used and the time spent on intervention. Descriptive data collected from the respondents was used to explain the responses and to qualify the statistical data.
3.11. Ethical Considerations

Firstly, the researcher obtained an introductory letter from the graduate school at Kenyatta University after which the researcher applied for the research permit from the National Commission for Science, Technology and Innovation (NACOSTI). Secondly, the researcher made introductory visits to the institutions before the research assistants were sent to collect data. The researcher respected the privacy of the respondents. Their identities were concealed and they were not asked to write their names or the names of the institutions in the questionnaires. Lastly, the respondents were asked to give information voluntarily by signing the consent form, although some respondents did not sign the consent forms but consented verbally and gave their feedback. Their views were not influenced by the researcher or the research assistants in any way.

3.12. Consent Form

Consent form was developed according to the guidelines given by the Ethics Review Committee (ERC) at Kenyatta University. The Consent form was used to seek participant’s permission to take part in the research in their free will. Permission from the school authorities were sought first then the teachers and therapists were asked to either opt in or out of the observation by signing the consent form. Only those who accepted to take part in the research were asked to fill in the questionnaires and take part in the interviews. The participants’ privacy was observed by keeping their identity anonymous and the data collected was only used for the purpose of this research.
The next chapter analyses the findings of this study both statistically and descriptively. The research findings are discussed in line with the methodology described in this chapter.
CHAPTER FOUR
FINDINGS AND DISCUSSION

4.0. Introduction

This chapter presents and analyses the findings of the study. The first section of this chapter presents the background information of the respondents, namely, the mothers, teachers and occupational therapists. The second section presents the results of the research questions formulated in the study and discusses in form of themes. Each research question was tallied with respective questionnaire item from all the sampling units and analysed using frequency counts and percentages. The summary of these analyses are presented in tables and figures for interpretation. The third section analyses the hypothesis of the study and interprets it accordingly.

4.1. Response Rate

A total of one hundred and thirty one questionnaires were sent out through the research assistants and one hundred and ten were returned which is a response rate of 83.97%. Since this was above the recommended 50% which is acceptable according to Babbie (2003) for a survey research. Since the research assistants were recruited around the areas of research centres it was easy for them to follow up with the parents and get back the questionnaires. The interview schedules were filled up by the research assistants during the interviews while the observations were done by the researcher.
4.2. **Background information of the respondents**

This section describes the respondents and the environment where they were interviewed. It also comments on their general willingness to share their experiences in different intervention techniques.

4.2.1. **Description of the Mothers**

The mothers were sampled from both public and private schools. Mothers from the public schools were more open and willing to discuss their children while those from the private schools, home schools and MTT were more reserved and needed assurance on their privacy. Mothers from private schools, MTT and home schools filled in the questionnaires by themselves while most mothers from public schools needed help in filling in the questionnaires. The results from mothers’ questionnaires are given in summary and the characteristics of children presented in graphical way.

4.2.2. **Description of the Occupational Therapists**

The therapists interviewed were either working in the institutions or at home while involving the parents on both. They were either employed by the institutions or working on freelance or hired by the parents to work with their children at home or in schools. They had knowledge about autism and working on specific intervention programmes for children with autism. Out of the 11 occupational therapists interviewed, 9 were ladies while 3 were men. The therapists’ experience ranged from 1 year to 15 years.
4.2.3. Description of the Teachers

There were three groups of teachers, those working in schools, MTT and home schools. The teachers who were interviewed were open and willing to discuss their experiences and intervention methods. The teachers were interviewed in the schools after work. Out of the 29 teachers who were interviewed, 17 were female teachers while 12 were male teachers with experience ranging from 3 to 22 years.

4.3. Results of the Research Questions

This section analyses the results of the research questions which corresponds to the research objectives. The results are presented both statistically and descriptively for clarity.

4.3.1. Characteristics of children with Autism identified by mothers

The first objective was to identify the behavioural characteristics of children with autism in Nairobi City County. The research established that characteristics of children with autism varied from one child to the other. The age at which the mothers identified their children as having autism also varied from one child to the other. Although Diagnostic Statistical Manual outlines characteristics of autism, mothers relied on observable characteristics that made them aware of their children’s needs. The following were characteristics that mothers identified in their children and made them start seeking for help.
Table 4.1 Characteristics observed by mothers

<table>
<thead>
<tr>
<th>Characteristic observed</th>
<th>Reported cases</th>
<th>Percentage representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed speech</td>
<td>91</td>
<td>9.6</td>
</tr>
<tr>
<td>Lack of eye contact</td>
<td>89</td>
<td>9.3</td>
</tr>
<tr>
<td>Appearing deaf</td>
<td>74</td>
<td>7.8</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>71</td>
<td>7.5</td>
</tr>
<tr>
<td>Frequent tantrums that last long</td>
<td>71</td>
<td>7.5</td>
</tr>
<tr>
<td>Flapping hands when exited or anxious</td>
<td>68</td>
<td>7.2</td>
</tr>
<tr>
<td>Erratic sleep patterns</td>
<td>65</td>
<td>6.8</td>
</tr>
<tr>
<td>Rocking forth and backwards</td>
<td>63</td>
<td>6.6</td>
</tr>
<tr>
<td>Refusing changes</td>
<td>61</td>
<td>6.4</td>
</tr>
<tr>
<td>Lining objects</td>
<td>59</td>
<td>6.2</td>
</tr>
<tr>
<td>Walking tiptoe</td>
<td>48</td>
<td>5.0</td>
</tr>
<tr>
<td>Poor coordination</td>
<td>41</td>
<td>4.3</td>
</tr>
<tr>
<td>Delay in learning toileting skills</td>
<td>40</td>
<td>4.2</td>
</tr>
<tr>
<td>Limited sense of danger</td>
<td>40</td>
<td>4.2</td>
</tr>
<tr>
<td>Seizures</td>
<td>24</td>
<td>2.5</td>
</tr>
<tr>
<td>Ear infections</td>
<td>17</td>
<td>1.8</td>
</tr>
<tr>
<td>Lost acquired speech</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td>Gut problems</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td>Screaming uncontrollably</td>
<td>5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Delayed speech was reported as a dominant characteristic by many mothers. Mothers reported that they were concerned by speech delay and sought for help from doctors. A mother said for instance, “I took my son to different hospitals and the doctors told me that boys are always late, so I kept waiting but he never acquired speech.” Delayed speech formed 9.6% of the characteristics observed. Mothers got concerned when
children were approaching two years and not talking like the other children. Some children who had speech were not identified very early because the other behaviours were not as worrying as speech delays. Poor eye contact formed 9.3% of the characteristics observed although the mothers did not describe it as worrying as delayed speech. These finding agrees with Tager-Flusberg et al (2005) who found majority of children with autism with delayed speech while 50% of those who acquired speech still struggled with communication.

Some children appeared deaf and parents were advised to seek for help from audiologist for hearing tests which found that in as much as they appeared deaf to certain sounds or words, they actually had good hearing. This formed 7.8% of the characteristics observed by the mothers. They also reported that they thought that their children’s language difficulties were related to hearing problems. Some children appeared hyperactive and found it difficult to stay focused in an activity for a long period of time. This was reported in 7.5% of the characteristics observed. Although DSM-V does not consider it as part of diagnosis but it was reported in a significant number of children which agrees Leyfer et al (2006) who also reported that 55% of children they surveyed had significantly impairing ADHD, 31% of the children met the DSM-IV criteria for diagnosis for ADHD.

Frequent tantrums were observed in 7.5% of the documented characteristics seen in children in early years. The trigger of the tantrums was not identified by most of the mothers although some mothers noted that tantrums were a way of communication,
seeking attention or a response to changes which the child did not want. A mother said for instance that he child cried a lot when she was hungry or wanted to go to the toilet. Flapping of hands was reported in 7.2 of the characteristics. This alternated tantrums and appeared mainly when the child is either exited or anxious. This is in agreement with findings by Leyfer et al (2007) who found out that a large number of children with autism displayed bad temper when stressed and could not communicate their frustrations either verbally or using other means.

Some children were reported to have erratic sleep patterns. Some would spend a lot of time crying, giggling or sleeping late at night. A mother said for instance that, “my child cried a lot at night before sleeping and I did not know how to sooth him to sleep”. This was reported in 6.8 of the characteristics observed. A study by Horvath et al (2002) reported a slightly higher percentage of children with autism with sleep disorders. They reported that 64% of children with autism had general sleep disorders in which 41% had difficulty falling sleep, followed by frequent awakening at 34% and early morning awakening at 20%.

Some children spent significant time rocking back and forth which they did even when working. His formed 6.6% of the characteristics reported by the mothers. Rocking made it difficult for them to engage in play with their peers. Other than rocking which affected their social interaction, difficult in accepting changes in play and sharing play materials was reported in 6.4% of the characteristics observed. Similarly, Horvath et al (2002)
found that 43% of children with autism had more frequent irritability compared 13% in typical children.

Lining up objects and toys instead of playing with them was observed in 6.2% of the characteristics observed. Other behaviours which interfered with social interaction included walking tiptoe which formed 5% of the characteristic observed and poor coordination (4.3%). Poor coordination and low muscle tone also affected other functions. One of the mothers for instance, said that “I mush food for my son since he cannot chew and can stay the whole day without eating if I don’t feed him!” Poor coordination also affected balance, writing skills and general motor activities. In the study, 4.2% of the mothers reported that their children delayed in acquiring toileting skills which made the children to remain in diapers over a long period of time. Another 4.2% of the children did not have sense of danger and could jump from tables, cross the road without looking or touch dogs without caring. Similar findings were reported by Redlich (2010) who asserted that some children with autism were thought to be clumsy due to motor coordination challenges and took long to learn toileting.

A few mothers reported that their children experienced seizures that were being treated medically. Seizure disorders were reported in 2.5% of the characteristics observed. Mothers reported different characteristics like absent seizure, trembling, and fits as the symptoms they noticed in their children. Doherty (2013) reported similar finding although his research reported that 39% of children with autism had different seizures. The frequency of seizures was found to increase with the severity of autism and
commodity with intellectual challenge. Some mothers in this study noted that their children had a few words that they used repetitively out of context when playing by the time they were joining school.

A few mothers reported that their children had frequent ear infections which were treated medically. This formed 1.8% of the characteristics that were reported by mothers. Twelve mothers reported that their children were developing normally then they started regressing and lost the previously acquired speech and other skills. At first, they thought that this was as a result of the previous infections but later realised that their children’s symptoms were not related to the infection. This was very stressful since the mothers could not get a good explanation until the diagnosis was made.

A small number of mothers reported that their children experienced gut problem such as indigestion and gas. A mother reported for instance that “I had to give my child digestive enzymes for a long time since he was bloated nearly every day.” This is in agreement with the findings by Horvath et al (2002) who interestingly found a higher number of children with autism with gut problems. Horvath et al (2002) reported that 76% of children with autism had Gastro Intestinal (GI) distress which persisted until adulthood and was managed with dietary interventions.

4.4. Mothers awareness of the signs of Autism

The second objective was to establish whether mothers were aware of signs of autism before their children were diagnosed. The finding indicates that majority of the mothers
had not heard about autism before their children were identified and diagnosed with autism. Therefore, when their children started behaving differently and not learning certain life skills like other children, they sought for help from different places. A mother who went through difficult time said for instance that, “I went to different hospitals and prayed a lot before I met an occupational therapist at Kenyatta Hospital who diagnosed my child and told me about autism”. A few mothers who knew about autism were either working as teachers or in other areas where they met children or had had relatives with autism. The study found out that at least 87 mothers (79.09%) surveyed had not heard about autism before the diagnosis. They sought for medical advice and got referrals for assessment in the hospitals and assessment centres. The study also established that 12.72% of the mothers had heard about autism either from schools, seen it on TV or other media but only 8.18% were aware of the signs of autism either because it’s in the family or because they worked in places where they had interacted with children with autism. These findings are in agreement with a similar study done in India by Bashir1 et al (2014) who reported that parents are increasing becoming aware of signs and interventions of autism but the level of awareness was still low.

Figure 4.1 Mothers awareness of the symptoms of autism
4.5. **Intervention strategies used by mothers in early intervention**

The third objective of the study was to find out the strategies used for early intervention by mothers of children with autism. The study found out that mothers sought for help after the diagnosis or when they realised that their children were not developing like the other children. Some of the professional they visited for advice included the doctors in hospitals, occupational therapists, speech therapists and teachers. Some children were referred for further evaluation while others were taken for specific interventions where mothers learned how to work with their children to complement what the professionals were doing. The following are some of the interventions used by the mothers:

4.5.1. **Dietary Intervention and Supplementation**

A significant number of mothers reported that they had been advised by other parents, teachers and therapists to change their children’s diet with a hope that changes in diet would reduce some symptoms like hyperactivity. This formed 19.8 of the interventions used. Most mothers said that they were advised to avoid added sugars, dairy, wheat products, processed and preserved foods among others. They were also supplementing fish oils and generally feeding their children in what they considered healthy food. Other supplements that mothers gave their children were multivitamins, zinc, Dimethyl glycine (DMG), vitamin B6 with magnesium and vitamin C. Some mothers reported that they saw a significant difference after starting supplementation while others said that they had not noticed a difference in their children’s behaviours. Two mothers reported that they felt that their children regressed when they started giving their children supplements. As
explained by Holford (2004), change in diet and supplementing deficient nutrients may significantly improve a child’s behaviour.

4.5.2. Play Therapy

Some mothers were advised by doctors, therapist and teachers to get different toys and play with their children at home. Although the mothers did not have formal training in play therapy, the teachers, occupational therapists and doctors encouraged them to keep playing with a hope that their children would develop speech, start playing with other children and learn other skills through play. Play therapy was considered an important part of intervention representing 18.8% of the interventions used. Some mothers said that they got training from the therapists and teachers on how to play, others just tried playing without training while others searched for information from the internet, attended parents training and consulted with the special needs teachers. As discussed in the literature, play is considered a more natural way of training children with autism social and living skills (Koegel, 2004) and provides avenue for practicing social skills.

4.5.3. Occupational Therapy

A significant number of mothers either took their children for occupational therapy in public or private hospitals or sought for their services in schools. Some parents invited occupational therapists to come home and work with their children. Occupational therapy was reported as an important intervention forming 19.6% of the interventions used. The therapists also helped to improve the children’s muscle tone, coordination as well as
training in Activities of Daily Living like dressing, toileting, feeding and personal hygiene among others.

The study results were supported by Duncan (2012) who says that the overall goal of occupational therapy is to help a child with autism to improve his/her quality of life. This includes life at home and in school. The therapist helps introduce, maintain, and improve social and independent living skills. That way, people with autism can be as independent as possible since these skills help them to learn social skills, how to focus on tasks, delay gratification or wait for their turn in play or communication, express feelings in more appropriate ways while playing with peers and also learn how to self-regulate among others.

4.5.4. Speech Therapy
Speech therapy was equally considered important intervention with 12.1% of the mothers interviewed reporting they were taking their children for speech therapy. The parents were working either with the therapist themselves or with their assistants. After learning from the speech therapists, parents could do most of the speech activities at home. The mothers who learned a few speech therapy activities, used play based approach to help their children learn basic communication skills. The speech therapy services were available at the Gertrude’s Children Hospital in Muthaiga, Aga Khan Hospital, Nairobi Hospital; some therapists operated in their centres while others visited schools, homes and MTT.
The mothers did not only take their children to the speech therapists to be taught communication but the therapists also worked on improving chewing and swallowing in children who had difficulties with feeding. They also worked with children with oral sensitivity to improve their oral sensory processing and thus improve feeding. Other children were taken to the speech therapists to help them with low oral muscle tone which led to drooling.

This result is supported by Lubinski (2010) who outlines the scope of Speech and Language Therapists (SLT) to include prevention of secondary language difficulties, screening, consultation, assessment, treatment, management, counselling and follow up services for disorders of speech such as difficulty with articulation, fluency, resonance, and voice, swallowing and upper aero-digestive functioning which are vital part of interventions needed by children with autism.

4.5.5. Floortime Therapy

Some mothers, who learned from other parents or read from the internet, were doing Floortime therapy. Parents reported that Floortime therapy was easier to use since it is play based and does not require a lot of training making it among the preferred intervention at 10.5% of the interventions reported. The mothers cited the cost of toys, lack of enough room and difficult behaviours like hyperactivity and aggression as the major huddles to deal with when doing Floortime therapy. As explained by Greenspan et al (2003), a child's actions are assumed to be purposeful and can be used to train a child in play, communication and social interaction. Through this intervention, a child is able to learn self-regulation, two-way communication and emotional thinking.
4.5.6. **Son-Rise Programme**

A few parents were following the Son-Rise programme mainly in the Home Schools or in the Mother-to-Toddlers programmes. Son-Rise programme was used by 6.5% of the mothers who were interviewed. Mothers who followed this programme said that they children became calmer and more focused after the interventions. Since the program is a parent-directed, relationship-based play therapy as explained by Kaufman et al (1995), it is easier to train parents to use it. The mothers who were doing Son Rise said that they work in turns with their children and also get assistant teachers to play with the children in the programme. Although Son-Rise is a distinct method of intervention, it borrows heavily from structured play and Floortime since it is play based and follows the child’s lead or interests.

4.5.7. **Auditory integration training (AIT)**

There is one centre offering AIT services in Nairobi that is at Acorn Special Tutorials. A few parents had accessed the services. AIT is a new therapy although by 6.1% of the mothers interviewed. Some mothers reported that their children had slight improvements while others did not seem improvement in hearing and understanding of spoken language after the completion of the AIT sessions. Although some mothers did not record improvement in processing language, a research by Thomas (2011) found significant improvement in processing language among children with auditory processing disorder.
4.5.8. **Applied Behaviour Analysis (ABA)**

Eleven mothers (2.8%) reported that they were doing Applied Behaviour Analysis (ABA) either themselves or taking their children to the centre where it is done. The mothers who were doing ABA reported that they had seen improvement in social interaction, following instructions and waiting for turns in play activities. This finding is supported by the study done by Spreckley *et al.*, (2009) who reported that children with autism who underwent ABA training made significant progress in social interaction, communication and life skills.

4.5.9. **Pet therapy**

Seven mothers (1.0%) said they were doing pet therapy. The activities in the pet therapy included horse-riding, playing with dogs, tortoise, rabbits and hamsters. There are two pet therapy centres in Nairobi; one in Karen with different animals and another one in Kitisuru. The mothers reported that the pets helped to reduce anxiety, fear of animals and increased their social interaction. Although Pet therapy is not commonly used, a study by Siewertsen (2015) reported that it improved social interaction and reduced phobias in children with autism.

4.5.10. **Homeopathy**

A few mothers (1%) reported that they had tried homeopathy to improve sleep patterns and reduce hyperactivity in their children. A mother interviewed said for instance that homeopathic medicine had helped improve her son’s digestion and muscle tone. Dana (2015) explains that homeopathy is used to treat wide range of conditions, including
physical conditions such as asthma and psychological conditions such as depression. It is currently being used to treat other conditions like autism, ADH and cerebral palsy in children. A few parents sought for StemCell therapy as explained in the next page.

4.5.11. StemCell therapy

Another two parents (0.5%) reported that they had taken their children to the USA for Stem Cell therapy but did not see significant improvement in the symptoms of autism. Autism Centre of Excellence (2015) explains that stem cell therapy is the use of stem cells to treat or prevent a disease or condition. Bone marrow transplant is the most widely used stem cell therapy, but some therapies derived from umbilical cord blood are also in use (Autism Centre of Excellence, 2015). It is however difficult to isolate improvement from Stem Cell therapy since parents always use different intervention strategies with their children. Autism Centre of Excellence (2015) says that there is a lot of research going on and it will be possible to establish the success rate of the therapy in future.

4.5.12. Not following any specific intervention technique

There were five mothers (1.3%) who were not using any specific intervention technique at home either because they did not know what to do or because they were too busy and had employed someone to work with their children at home or in school. Two of the five mothers felt that their children could never make any progress and they had given up on the interventions. Some mothers were also not following any intervention technique because they did not have the resources such as toys and could not afford them.
4.6. Intervention strategies used by teachers and therapists

The third objective sought to find out the intervention strategies used by teachers and therapists. Teachers and therapists worked with the children in schools, at home or in the centres. Their work was more structured with documentation like individualised education program (IEP) used by teachers and Individualised Treatment Plan ITP used by the therapists. This section analyses the intervention strategies they used.

4.6.1. Intervention strategies used by teachers

Teachers used a variety of strategies in early intervention according to the characteristics presented by the children. Strategies used by teachers are presented in table 4.3 below:
Table 4.2 Intervention strategies used by the teachers

<table>
<thead>
<tr>
<th>Intervention Strategies used</th>
<th>Number of teachers using it</th>
<th>Percentage of teachers using it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour modification</td>
<td>22</td>
<td>22.4</td>
</tr>
<tr>
<td>IEP</td>
<td>15</td>
<td>15.3</td>
</tr>
<tr>
<td>Structured teaching</td>
<td>15</td>
<td>15.3</td>
</tr>
<tr>
<td>Structured play</td>
<td>12</td>
<td>12.3</td>
</tr>
<tr>
<td>PECS</td>
<td>9</td>
<td>9.2</td>
</tr>
<tr>
<td>Individualized support</td>
<td>9</td>
<td>9.2</td>
</tr>
<tr>
<td>Motor skills training</td>
<td>7</td>
<td>7.1</td>
</tr>
</tbody>
</table>

4.6.1.1 Behaviour Modification

Majority of teachers reported that they had been using different behaviour modification techniques. Twenty two teachers (22.4%) reported that they were using different behaviour modification techniques like: positive reinforcement for good behaviours, negative reinforcement and punishment for unacceptable behaviours. They reported that they have been working closely with parents to modify children behaviours. They found that consistency in behaviour modification where parents worked with the teachers using the same methods such as dealing with tantrums and aggression yielded more results than when teachers worked alone. Three teachers (14.3%) said that they had not noticed challenging behaviour in the children they were working with. The teachers from home schools and MTT did not mention behaviour modification as being used in their intervention plans.
4.6.1.2 Individualised Education Programme

Most schools required the teachers to develop and use IEP to guide their work. In this study, 15.3% of the teachers reported that they were using IEP in their implementation of the intervention plans. Different schools had different IEP formats that basically included the core objectives to be achieved in the intervention. The teachers developed the IEPs following the recommendations from the assessment reports, their own observation and advice from therapists.

4.6.1.3. Structured Teaching

A number of teachers reported doing structured teaching. This involves organizing their classroom with visual structures like visual timetable, visual class rules on flash cards, among other visual schedules. Fifteen teachers (15.3%) were doing structured teaching which they found easier to use since children with autism enjoyed working with definite structures. Although not all teachers who were observed were strictly following visual structures, but there were evidence of structured teaching in the classrooms such as visual timetables.

Structured teaching is a teaching method that was started by the University of North Carolina, Division Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH) to help deal with difficulties encountered by children with autism (Virues-Ortega, Julio, and Pastor, 2013). This approach deals with specific ways of teaching children with autism. It enables teachers to use a variety of teaching methods such as visual support strategies, Picture Exchange Communication System -
PECS, music therapy, discrete trial, sensory integration strategies, and play among others. It describes the conditions under which a person should be taught rather than "where" or "what" of learning. Structured teaching greatly increases a child's independent functioning which will assist him throughout life.

4.6.1.4. Structured Play

A significant number of teachers said that they had used or were using play therapy to train children in social interaction, communication and living skills. Twelve teachers (12.3%) teachers reported that they have used play therapy with positive response. They also reported that play improved their rapport with the children which led to better outcomes in the interventions. The greatest challenge that teachers cited in play was lack of resources and even when schools bought toys, they break easily and children carry some when going home. Teachers also noted that play needed a lot of time and there is no written evidence of learning to show parents and so the school administration and parents do not always support play. This finding is in agreement with the research finding by Rebecca et al (2012) who reported significant improvement in social interaction following training in play.

4.6.1.5. Picture Exchange Communication System (PECS).

A few teachers were using pictures for communication. Although they reported that they had significant challenges in implementing it because parents were not using it at home thereby limiting its success, they still found it useful in school since it helped the children
to communicate their basic needs. Nine teachers (9.2%) reported that they were using PECS in their classroom. During the observation, none of the children were found to be efficient in using pictures for communication in the classrooms although teachers claimed that some of them could use the pictures to communicate their basic needs like toileting and requesting for toys. As explained by Tincani et al. (2010), PECS improves children’s communication and some children acquire speech after using PECS for a while. Teachers reported that improving children’s communication significantly improved their learning.

4.6.1.6. Structured outdoor activities

Some teachers were using structured outdoor activities to train children in social interaction. Among the skills they trained using structured outdoor activities included playing football, running, swinging, sliding, playing in the sandpit among others. Nine (9.2%) teachers used this technique in their schools. They reported that after training children over a period of time, their play skills improved and they interacted well with other children in the school. Teachers in the MTT, home schools and private schools had more and better outdoor facilities compared to the public schools that only had swings and sandpits.

4.6.1.7. Training in Motor Skills

Teachers also trained the children in fine and gross motor skills to improve their energy levels, coordination and muscle endurance. Seven teachers (7.1%) trained their pupils in pincer grip to improve handwriting and colouring, beading to improve eye-hand
coordination and other activities to improve their gross motor coordination. The other
motor skills included gross motor activities like throwing and catching a ball, kicking a
ball, rolling a ball, swinging, running along a straight line and skipping among others.
These are skills that children could use in different activities when playing, doing
Physical Education, games and sports. Children who spent longer time in physical
training became better at play and games.

4.6.1.8. Individualized Support

Some children needed more individualized support so the teachers gave them one to one
support in those specific areas. Some children needed support to learn toileting, dressing,
feeding-self and personal hygiene. Other areas that teachers identified as needing 1-1
support were reading, spelling and training in PECs at the initial stages. Nine (9.2%) of
the teachers had a few individualized teaching lessons to complement the group lessons.
Teachers reported that individualised lessons enabled them to cover more work and
differentiate the content to the level of the child. Children who are hyperactive and highly
distracted were reported to do well in secluded environment with less distraction with
individualised instructions.

Two out of the ten schools studied had separate learning support departments where
children were withdrawn to for individualised support. The learning support rooms were
well equipped with both commercial resources and modified resources that teachers
made.
4.6.2.0. Interventions used by occupational therapists

The intervention services were typically provided on one to one format with a few group sessions. Therapists preferred individualised sessions when training in specific skills that require hands on approach when working. Activities that required manual handling and individualised instructions were mainly done in the therapy room. The next table summarises the interventions used by the Occupational Therapists.

Table 4.3: Interventions used by occupational therapists

<table>
<thead>
<tr>
<th>Intervention Strategy</th>
<th>Number of Therapists</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory Integration</td>
<td>8</td>
<td>22.2</td>
</tr>
<tr>
<td>Developmental Skill Based Programme</td>
<td>8</td>
<td>22.2</td>
</tr>
<tr>
<td>Play Therapy</td>
<td>7</td>
<td>19.4</td>
</tr>
<tr>
<td>Positive Reinforcement</td>
<td>7</td>
<td>19.4</td>
</tr>
<tr>
<td>Training in Living Skills</td>
<td>6</td>
<td>16.7</td>
</tr>
</tbody>
</table>

4.6.2.1. Sensory Integration

In this study, 8 therapists (72.7%) reported that some children had problem with sensory processing such as tactile, auditory, vestibule and visual sensitivities. To deal with these sensory processing difficulties, they engaged the children in sensory activities like massage for tactile sensitivity, music and movement for auditory sensitivity, swinging on a hammock or swings for vestibule sensitivity and working on the light box for visual sensitivities. They also advised the teachers and parents to continue with the activities in
class or at home after therapy sessions. All the therapists who were working in the home schools (2 therapists) and those working in the MTT programmes (2 therapists) said that they were doing sensory integration with the children they were working with. They said that sensory integration was a good part of intervention given for early intervention.

4.6.2.2. Play Therapy

Majority of the therapists were using play either as a therapy or for establishing rapport with the children. Seven therapists (63.6%) reported that they used play in their sessions making play the most important intervention used by therapist, parents and teachers. Play therapy allowed bonding in the therapy sessions thereby increasing the participation of the children. They used play to train in motor skills, behaviour modification and social skills. Therapists also reported that they found play very instrumental when training children in activities that required cooperation including shared enjoyment where the child had to work with other children.

4.6.2.3. Positive Reinforcement

Therapists also reported that they found positive reinforcement important in increasing the frequency of desired behaviours in children like asking for play materials, sharing toys and completing short tasks. Seven therapists (63.6%) reported that they have been using positive reinforcement with good results in their sessions. They reported that children liked stickers, smiling faces on their hands and tokens given to them.
4.6.2.4. Developmental Skill Based Programme

Since a number of children with autism lacked basic developmental skills, eight therapists (72.7%) said that they were teaching pupils developmental skills like dressing, washing hands, playing with a variety of toys, communicating their needs and following instructions. They said that the children’s social skills improve with time and they become more independent.

4.6.2.5. Training in living skills

The occupational therapists also said that they were training children in the activities of daily living such as toileting, feeding self, dressing, brushing teeth among others. Six of the therapists (54.5%) were training in ADLs and found improvement in the children’s performance after training. Training in activities of daily living greatly improved the children’s social interaction and level of independence.

Figure 4.2 Interventions used by the occupational therapists
4.7. Progress noticed in children after early intervention

The fourth objective sought to document the changes in behaviour noticed in children following early intervention strategies used. The researcher established that mothers noticed different changes in children’s behaviours ranging from mild to significant changes. The summary of the progress noticed by the mothers is tabulated as follows:

Table 4.4 Progress noticed after early intervention

<table>
<thead>
<tr>
<th>Behaviours that improved</th>
<th>Number of reported cases</th>
<th>Percentage of improved cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact- looking at the speaker</td>
<td>82</td>
<td>72.5</td>
</tr>
<tr>
<td>Cooperative play- playing with peers</td>
<td>82</td>
<td>72.5</td>
</tr>
<tr>
<td>Reduction in hyperactivity</td>
<td>80</td>
<td>72.72</td>
</tr>
<tr>
<td>Following instructions</td>
<td>80</td>
<td>72.72</td>
</tr>
<tr>
<td>Improved toileting skills</td>
<td>80</td>
<td>72.72</td>
</tr>
<tr>
<td>Improvement in academic work</td>
<td>76</td>
<td>69.09</td>
</tr>
<tr>
<td>Reduction in ritualistic behaviour- flapping hands</td>
<td>70</td>
<td>63.63</td>
</tr>
<tr>
<td>Reduction in tantrums</td>
<td>58</td>
<td>52.72</td>
</tr>
<tr>
<td>Speech acquisition</td>
<td>58</td>
<td>52.72</td>
</tr>
<tr>
<td>Improved attention span</td>
<td>49</td>
<td>44.54</td>
</tr>
<tr>
<td>Improved motor coordination</td>
<td>47</td>
<td>42.72</td>
</tr>
<tr>
<td>Reduction in aloofness- being alert</td>
<td>47</td>
<td>42.72</td>
</tr>
<tr>
<td>Understanding stories</td>
<td>29</td>
<td>26.36</td>
</tr>
<tr>
<td>Awareness of danger</td>
<td>17</td>
<td>15.45</td>
</tr>
<tr>
<td>Eating habits- eating a variety of foods</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td>Improvement in auditory processing</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td>No change</td>
<td>17</td>
<td>15.45</td>
</tr>
<tr>
<td>Regressed</td>
<td>3</td>
<td>2.72</td>
</tr>
</tbody>
</table>
Significant improvement in eye contact in 74.5% of the children surveyed agrees with Mortimer et al. (2005) who reposted that among improvements noticed in children after early intervention is improvement in eye contact, communication skills and social interaction. They could look at the person talking to them and turn when their name was called. Another 74.5% of the children improved their play skills. They could play with other children cooperatively and also engaged in pretend play after some training.

Mothers also reported a significant reduction in hyperactivity in 72.72% of the children. They noted that the children could settle and play or do school work without intensive supervision. The children who became calm were following instructions more than when they were hyperactive. Another 72.72% of the children improved their ability to follow instructions, they could be sent to do things and be given responsibilities in the classroom and at home. Mothers felt that diet helped their children to calm down faster. Three mothers (2.72%) reported that their children regressed when they started working on diet and supplementation while seventeen mothers (15.45%) did not notice any change that they might have attributed to dietary intervention. They however, attributed the improvements to other interventions like occupational therapy, speech therapy and learning support done in the schools.

Mothers also reported that their children learned toileting skills. At least 72.72% of the children learned how to use toilets either independently or with minimal help. They could communicate their toileting needs either verbally or using pictures when prompted. They
learned how to use the washrooms and clean themselves after using the washrooms. While 70 (63.63%) of children who had ritualistic activities like flapping hands and whirling around circles in classroom reduced the frequency of the ritualistic activities. They became more settled than before. Significant improvement in academic work was noted in 76 (69.09%) of the children. They could do homework and complete most of the academic work with less assistance. Fifty eight (52.72%) of the mothers reported that their children’s tantrums reduced significantly.

This finding is supported by Leyfer et al (2006) who found out that children reduced tantrums when they improved their communication skills. They became calmer, shared toys and accepted changes in their environment, another 58 (52.72%) acquired speech ranging from few words to average ability in communication following a long-term intervention. They also noted that 49 children (44.54%) improved their attention span and could work on activities like completing jigsaw puzzles over a period of time. There was also significant improvement in coordination in 47 children (42.72%), another 42.72% improved their alertness as they stopped being aloof. Twenty nine children (26.36%) started enjoying storytelling, seventeen (15.45%) improved their sense of danger, they became more aware of danger and stopped jumping from heights, showed fear of strange animals, and fire etc, while 8 children (7.27%) improved their eating habits and another 7.27% improved their auditory processing and stopped blocking their ears to certain sounds.
4.8. **Resources used for Early Intervention**

The last objective sought to establish the resources used for early intervention. As indicated by Autism Now (2015), different interventions required different resources. Mothers, teachers and therapists shared certain resources while there other resources that were very specific to the service provider. Since mothers who were doing home schooling, working in the Mothers to Toddlers programmes were involved in play, education and therapy, the following were some of the resources they identified:

**4.8.1. Resources for Play**

Assorted play materials were used. Those resources included: toy cars, dolls, animal toys, building blocks, Legos, kitchen set, doctor-doctor set, assorted machines, balls, bubble soap, to -fruits, toy mobiles, bowls and kettles, skipping rope, modelling clay among others.

**4.8.2. Academic Resources**

Academic resources were either autism specific or modified resources. The resources included wax crayons, pencils; colouring books, mini white boards, sand trays, nursery rhyme books, story books, fidgeting pencil, cushion-ball, PECs board with pictures, visual timers, visual timetables, jigsaw puzzles, play-dough. They also used electronic resources like Proloquo2Go for communication (was used by two children), my first 100 words – is a book with audio feedback, audiocassette, musical instruments (mainly drums), and computers which they used to train ICT.
4.8.3. **Occupational Therapy Resources**

Since they had therapists coming to work with children, some resources identified included: therapy ball, pegboard, pin board, lacing board, vibrators and muscle stretchers, arm string, weighted jacket, hand weights, hammock and assorted toys.

4.8.4. **Resources used by schools**

Schools used different resources in classroom. Some of the resources identified by teachers included: PECs board, visual timers, talking mat, pencil grippers, colouring books, wax crayons, developmental reading materials, play materials, stickers (for reinforcement), audio recorder/player for music and movement, beads (for beading), lacing board, buttoning board, zipping board, white boards for writing among other play materials.

Therapy materials remained the same in schools as at home. The teachers and therapists modified materials according to the needs of the pupils they were working with.

4.9. **Analysis of the theories**

The study was based on the theory of social constructivism forwarded by Vygotsky in 1978 which maintains that functions in child’s cultural development appears first at social level and later at individual level.
This study established that exposure of the child to different training at individual and
group level resulted to positive change in their behaviour. Positive reinforcement during
the training and therapy resulted in acquisition of the desired behaviours like establishing
eye contact when talking, playing with other children, learning activities of daily living
and reduction of undesired behaviours like tantrums and hyperactivity.

Contrary to Vygotsky’s theory that maintains that the behaviour first appears at social
level and later to individual level, early intervention for children with Autism required
individual training first before moving to group or social training, thus the behaviour first
appears at individual level then transferred to the social group for social functioning. For
instance, children were trained on one to one lessons on how to play then once learned
the play skills; they were introduced to small groups and taught how to play with their
peers in social environment. Since children with autism find it difficult to learn by
imitating other children in social environment, they have to be given individualised
training in individualised setting then slowly integrated in a small group where they can
apply the knowledge they have been taught.

The findings of the study agrees with Vygotsky’s assertion that all higher functions
originate as actual relationships between individuals (Vygotsky, 1978:57) since parents
and therapists noticed significant improvement in academic progress, social interaction,
being alert among others when the children started playing and generally interacting with
their peers.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0. Introduction
In the previous chapter, the data was analysed, results presented and discussed. The main objective of this chapter is to present the summary of the findings and make conclusions and recommendations of the study. The chapter has three sub-sections namely; summary of the study, conclusions and recommendation.

5.1. Summary of the Study
This research was designed to study mothers’ participation in early identification and intervention of children with autism. The objectives of this study were to investigate the behavioural characteristics of autism identified by mothers in their children, establish whether mothers were aware of signs of autism before their children were diagnosed, find out the strategies used for early intervention by mothers, identify the strategies used by teachers and occupational therapists in early intervention of children with autism, find out the changes in behaviour noticed by mothers after early intervention and find out the type of resources mothers use for early intervention.

The research was done in Nairobi County in both public and private schools. Home schools and mothers to toddlers’ programmes were included in the study. The research established that mothers who identified their children early, got them assessed, diagnosed
and put them in early intervention either at home or in schools or both had significant reduction in the symptoms of autism while those who were not identified early continued to struggle significantly. The study found a positive correlation between early intervention and improvement in the autism symptoms. Seven mothers who were involved in intensive early intervention claimed that their children outgrew symptoms of autism and were doing well in inclusive classrooms with minimal support while mothers who were not involved in the interventions did not see significant improvement even after taking their children to school or therapy centres. The occupational therapists and teachers worked closely with the parents in early identification, assessment and intervention.

5.2. Characteristics of the Respondents

The respondents comprised of the mothers of children with autism, teachers and therapist. The mothers were from different schools, mothers to toddler’s programmes and home schools. There were mothers from both public and private schools. The mothers from private schools were all from the upper middleclass while those from public schools were mixed. Fourteen mothers from public schools could not read or write so they were helped by the research assistants to fill in the questionnaires. Nine out of the eleven Occupational Therapists were ladies while two were men. The occupational therapists had experience varying from one year to fifteen years. There were seventeen female teachers and twelve male teachers with experience ranging from three years to twenty two years.
5.3. **Summary of the Findings**

The findings based on the objectives of the study are given below.

Involving mothers in early identification led to early diagnosis and intervention. Children who were identified early and whose parents worked closely with the occupational therapists and teachers made significant progress compared to children who were not identified early and those whose parents did not take active role in their identification and interventions. Mothers who did not take active role in the interventions had the least improvement in the symptoms of autism and academic scores in the school.

On the question regarding the characteristics identified by mothers, the study found several characteristics that mothers noticed in their children, some which are not documented in the DSM-V such as screaming a lot in early years, significant and persistent tantrums, poor sleep patterns, significant hyperactivity being picky eater and head bunging, which are consistent with other studies done by Leyfer et al 2006, Hsu 2009 and Inge-Marie et al 2011. Other symptoms included delayed speech development, poor eye contact, presence of ritualistic behaviours, and difficulty with social understanding and challenges in sensory processing. These symptoms may be used as red flags in future identification of children with autism. It is however not clear whether these symptoms are culturally based or they are triggered by the underlying causes of autism.

On the questions about the interventions used, the study found several intervention strategies that are used by the mothers, teachers and therapists in Nairobi. It is not
however clear whether the same interventions are used in the other counties. Nairobi being an urban county has several service providers and resources that may not be available in the rural counties. Some of the interventions used included Floortime therapy, Son Rise, Auditory Integrated Training, ABA, dietary intervention, occupational and speech therapy among others. There were other therapies that are less documented such as stem cell therapy, homeopathy and pet therapy that parents are trying with their children. They used variety of resources ranging from modified regular educational and paly resources to autism specific resources like PECS and Proloquo2Go among others.

The study documented several interventions used in Nairobi City County by mothers, teachers and occupational therapists both at home and in the institutions. These intervention strategies included Structured play which was used at home, in the Mothers to Toddler’s programmes and in schools; Floortime therapy was mainly used at home and at mothers to toddlers programme; Structured teaching was mainly used in schools since it required the development of visual and social structures; Sensory Integration was used by occupational therapists to improve sensory processing in the children with challenges in sensory processing; a few parents followed Son-Rise programme to help children learn social skills; Developmental Social skills training was used by occupational therapists to train in the activities of daily living, age appropriate play skills and social communication; Picture Exchange Communication System was used to improve children’s level of communication and positive reinforcement used by all the respondents to increase the frequency of the desired behaviour and decrease the undesired behaviours.
On the question about the changes in behaviour noticed as a result of early intervention, the report established that parents noted reduction in the symptoms of autism which included significant improvement in children’s behaviour after participating in early intervention over a period of time. Amongst the most notable improvements included the following: improvement in social interaction, communication skills either through speech or body language, reduction of tantrums, hyperactivity and improvement in attention span and alertness. They also reported improvement in play skills, reduction in ritualistic behaviours like flapping hands and general improvement in academic performance.

The last question sought to establish the resources used for early intervention. Early intervention mainly took the form of play therapy and intensive interaction and sensory training among others. The resources used varied depending on the needs of the child in question. Some of the resources used included assorted toys, developmental cognitive programmes, computer software and occupational therapy resources.

5.4. Conclusions

The study arrived at the following conclusions based on the research findings:

The study concluded that mother’s participation in early identification and intervention was very important. Although mothers may not always know what to do after identification, they have crucial information needed for evaluation, diagnosis and planning for intervention.
The study also found out that including parents especially mothers in early intervention techniques lowers mothers anxiety and stress that are generated by the child’s condition and improves the child’s functioning.

The study concluded that other than children with autism benefiting from early intervention, their siblings, peers and parents also benefited from the whole process. Parents, especially mothers learn to cope with and meet the needs of their children while the siblings learn to support them and also cope with negative emotions that come with having a sibling who has autism.

Early intervention was found to be crucial in accelerating the child’s development, acquisition of functional and academic skills and improving inclusion of the child in the social and educational settings. Mothers played a crucial role in the whole process.

On the question on the type of intervention strategies used, the study concluded that there is no one strategy that was used by all the parents, teachers and therapists to yield a lot of results in all the children. They used multiple of strategies at home and in schools. Different children responded differently to different therapies, therefore, multiple approaches are recommended and collaboration between the parents, teachers and therapists are recommended.

The study found out that the characteristics of autism noticed by mothers varied from one child to the other. Some mothers reported certain characteristics that are not documented in the DSM-V as part of the diagnosis of autism. The study concluded that characteristics
of autism are unique to every child; they are manifested differently and vary in severity. The severity of autism should be used to determine the intensity of early intervention programmes for better outcomes to be realised.

On the question about intervention strategies used, the study reported a variety of interventions being used in Nairobi County. However, most of the interventions were play based and shared a lot of resemblance. The underlying objectives of the interventions were the same in all the cases; to reduce symptoms of autism, improve communication, social understanding and activities of daily living. The basic principles were to help children learn in a happy environment, reinforce positive behaviours and discourage negative behaviours.

The study established that majority of the mothers were not aware of autism before their children were diagnosed. Mothers who worked in schools or had relatives with autism had more awareness than those who had not come across a person with autism. Mothers who were aware of the symptoms of autism started the intervention earlier and made better choices on interventions than those who waited for decisions to be made by occupational therapists and teachers.

On the question about resources used for early intervention, the research found out that since most of the strategies used for early intervention were play-based, there was an overlap in the usage of the resources although there were certain resources that were either specific for occupational therapy while others for educational and home based interventions. Most of the resources used ranged from toys, therapy materials to
educational resources. These resources were sourced locally, made by parents or bought by therapists.

5.5. Recommendations

Based on the results, a number of recommendations have been given for schools, home schooling and Mothers to Toddlers programmes.

5.5.1. General recommendations

Early intervention has been found to be so critical in spear heading children’s development in early years. Early identification should therefore be encouraged. Children should be identified as early as possible and appropriate interventions put in place to improve the child’s development. Parents, teachers, care givers and therapists should be trained in early identification and intervention so that they can take active role in the early intervention.

5.5.2. Recommendations to the Ministry of Education

Early identification symptoms should be taught to the teachers especially the early year’s educators to help in early identification as soon as the child joins day care or pre-school. Since mothers can pick up early indicators before children are of school age, it is necessary for awareness campaigns to be done in schools to sensitize parents to take part in early identification.
Teachers need to be trained in different intervention strategies to increase the chances of inclusion of children with autism in the main stream education. Since early intervention improves the child’s condition, it therefore increases chances of inclusion.

Acquire enough resources for early intervention so as to enable children to maximize their potential in early years. Since teachers struggle with getting resources, modifying resources and adapting resources, equipping the schools with the right resources will improve the quality of early intervention services offered.

5.5.3. Recommendations to the Kenya Institute of Curriculum Development

It is necessary for the Kenya Institute of Curriculum Development (KICD) to include Early Intervention as one of the modules in teacher training. All the early childhood educators should be furnished with skills in early identification and intervention for them to take part in the whole process.

Make the module in early identification and intervention a core course since all the teachers will at some point need to take part in identification, development of intervention programme and implementation of the programme.
5.5.4. **Recommendation to Schools**

The schools should work closely with parents in identification of children as soon as they join school. Parents should be encouraged to give information that may lead to identification and intervention as early as possible.

The schools should acquire the right resources for early intervention. This may include setting up rooms for occupational therapy and individual support for teachers to give individualized support to children who needs it.

5.5.5. **Recommendations for Parents and other stakeholders**

Parents, teachers and therapists should always work together to help children in early years. This is especially important because it will reduce the acquisition of secondary disabilities in children.

Parents should be trained by teachers and therapists on different intervention strategies to be used and actively involve them in the intervention strategies.

Parents should be advised to start seeking for help as soon as they notice challenging behaviours in their children. The earlier they seek for help the earlier the intervention begins.

5.5.6. **Recommendations for further research**

Since there is no study on the prevalence of autism in Kenya, it is difficult to estimate the number of children who may need early intervention making planning on resources and
training specialists difficult. It is therefore recommended that a study on prevalence of autism be carried out in Kenya.

A study is required to establish which services are available for children with autism outside Nairobi County.

A study should also be carried to establish other early intervention techniques being used in other counties.

Lastly, a longitudinal study should be carried to establish the outcome of early intervention in adulthood, for instance, how adults who obtained early intervention were doing.
REFERENCES


Gutstein, S. & Sheely, R. (2002). *Relationship development intervention with young*


APPENDIX I:  QUESTIONNAIRE FOR MOTHERS

This questionnaire seeks information on the outcomes of early identification and intervention of children with autism. The information given is primarily for this research and will not be given to the third party. Do not include your name. For questions with options, tick the most applicable response.

AGE OF YOUR CHILD ______  GENDER: □ MALE  □ FEMALE

1.  a. At what age did you notice the early signs of autism in your child? _________
   b. Which characteristics did you see in your child?______________________________
   ________________________________________________________________
   c. What did you do when you noticed the early signs?___________________________
   ________________________________________________________________
   d. How severe were the characteristics you observed?
      □ Mild,  □ Moderate,  □ Severe

2. Which intervention strategies do you use to help your child at home?

3.  a. Has your child shown progress in communication, social skills or general behaviour since you started early intervention? □ No,  □ Yes
   b. If you ticked yes above, please explain the changes you have noticed in your child.
   ______________________________________________________________________
   ______________________________________________________________________

4.  a. Were you aware of autism before your child was diagnosed with autism?
      □ Yes  □ No
   b. If yes, how did you learn about autism? From:
      □ internet,  □ university/college  □ Doctor
      □ seminar/workshop,  □ friend  □ social worker
      □ therapist  □ teachers  □ others
c. Have you received any training on how to help your child?  □ No  □ Yes

d. If yes, was the training helpful?  (Please explain): _______________________

_____________________________________________________________________

Thank you for your cooperation.
APPENDIX II: INTERVIEW SCHEDULE FOR THERAPISTS

Ref: ___________ Date: ______________

Number of children with autism attending therapy sessions: _______

Ages of children you work with: from _____ to _____ years old

Gender: Number of Boys: _________ Girls: ___________

1. At what age do most parents bring their children for therapy? _______

2. Do you participate in early identification? □ □Yes □ □No

3. If yes, mention some of the characteristics you been seeing in children with autism: _____________________________________________

__________________________________________________________________

4. Which intervention strategies are you using? ___________________________

__________________________________________________________________

5. Have you been training mothers to continue with the strategies at home?
   □ Yes □ No

6. If, yes what are the responses? If not, why? __________________________

7. How long do you work with a child per session? ________________

8. How many sessions does a child have per week? ________________

9. What changes have you noticed in children after the early intervention?
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
10. Where do you get teaching/therapy materials you are using?

Thank you for your cooperation.
APPENDIX III: INTERVIEW SCHEDULE FOR TEACHERS

Ref: ___________ Date: ______________

Number of children in your class ________

Gender: Boys _________ Girls _________

Ages of children in your class: from _____ to _____ years old

1. At what age do most parents enrol their children in the school for interventions?

2. Do you participate in early identification? □ □ Yes □ No

3. If yes, which characteristics have you identified in children suspected to have autism?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

4. Which intervention strategies are you using in school?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

5. Which teaching materials are you using for the interventions?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

6. What changes have you noticed in the children after the early intervention?
8. a. Do you work closely with parents and other service providers like therapists?
   □ Yes □ No

   b. If yes, kindly explain how you coordinate the intervention activities; if No, kindly explain why not.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

   Thank you for your cooperation.
APPENDIX IV CONSENT FORM

My name is Onala, J. Ouma. I am a Ph.D. student at Kenyatta University. I am carrying out a research on Mothers’ involvement in early identification and intervention for children with autism in Nairobi County, Kenya. The information obtained will be used by the ministry of education to improve early identification and intervention for children with autism in special schools.

Procedure to be followed

Participation in this research will require that I ask you some questions on how your child was identified, assessed and helped in early years. The occupational therapists and the teachers will be asked to provide information on how they did early identification and intervention in the school. I will record the information in a questionnaire.

You have the right to refuse participation in this study. You will get some information on early identification and intervention whether you agree to join the study or not and your decision will not change the type of interventions you are currently receiving.

Please remember that participation in the study is voluntary. You may ask questions related to the study. You may refuse to respond to any questions and you may stop an interview at any time. You may also stop being in the study at any time without any consequences.
Discomforts and risks

If you are uncomfortable with some of the questions, you may not respond to them. You may also stop the interview at any time. The interview may add approximately half an hour your waiting time before you pick your child from the school.

Benefits

If you participate in this study, you will help us to learn how to improve early identification and intervention for children with autism. You will also receive information on how to improve the intervention that is currently being provided in the school.

Reward

If you participate in this study, you will access a copy of the research summary upon request.

Confidentiality

The interview will be conducted in the school and your identity will not be revealed. Your name will not be written on the questionnaire. The questionnaire will be kept in a locked cabinet for safe keeping at Kenyatta University. Everything will be kept private.

Contact information

If you have any questions you may contact my supervisor Prof Geoffrey Karugu Tel. 0716916439 or Dr. Madrine Kingendo Tel. 0739123109 or the Kenyatta University
Participant’s Statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand my records will be kept private and that I can leave the study at any time. I understand that my child will get the same educational intervention whether I decide to leave the study or not and my decision will not change the intervention my child receives.

Name of Participant ……………………………………
…………………………………
…………………………………

Signature or Thumbprint Date

Investigators statement

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

Name of the interviewer………………. Signature………… Date ………. 
Appendix v: Characteristics of children with autism

Adapted from Centre for Disease Control
(http://www.cdc.gov/ncbddd/autism/signs.html)

<table>
<thead>
<tr>
<th>Communication skills</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Speech delayed significantly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Echoes or bubbles unintelligible words or sounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Echoes or repeats words said to him/her</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Echoes or repeats words and sounds heard from TV or radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Responds selectively to certain sounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Appears deaf some times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Minimal speech which s/he does not always use</td>
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<td></td>
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<tr>
<td>8. Difficulty understanding and following simple instructions</td>
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<tr>
<td>9. Difficulty understanding directional terms (front, back, before, after).</td>
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<td></td>
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<tr>
<td>10. Difficult understanding or learning gestures</td>
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</tr>
<tr>
<td>11. Only communicates basic needs (asking for play materials or food)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Not interested in children stories (but may enjoy music)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Can tolerate some sounds while closes ears to certain sounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Difficulty reading facial expressions and body language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Understands language literally</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social understanding</th>
<th>yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did not reach out for a hug or to be carried in early years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Spent a lot of time alone or appeared happy when alone in early years</td>
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<tr>
<td>3. Responds to social interactions, but does not initiate them.</td>
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<tr>
<td>4. Does not generally share observations or experiences with others</td>
<td></td>
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</tr>
<tr>
<td>5. Has few/no preferred friends (plays alone most of the time)</td>
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<tr>
<td>6. Only plays with younger or older people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Rarely imitates other children when playing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. Rarely shares favourite toys or play space

9. Does not share play materials and/space

10. Withdraws in social places (classroom, playground or at home)

11. Unaware of/disinterested in what is going on around them.

12. Seems unable to understand another’s feelings

13. Does not always sustain eye contact when being talked to or playing

14. Facial expression does not always fit the situation (e.g. when happy or sad)

15. Shows no interest in people (other than parents)

<table>
<thead>
<tr>
<th>Flexibility of thought and behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plays with same objects over and over</td>
</tr>
<tr>
<td>2. Lines up toys/other play materials in specific way</td>
</tr>
<tr>
<td>3. Plays with parts of toys (e.g. spinning tyres, pulling hair or a doll etc)</td>
</tr>
<tr>
<td>4. Ritualistic or compulsive behaviour patterns (sniffing, licking, watching objects fall, spinning)</td>
</tr>
<tr>
<td>5. Spends some time flapping hands, rocking, tapping, sucking etc).</td>
</tr>
<tr>
<td>6. Fascination with rotation (e.g. spinning objects).</td>
</tr>
<tr>
<td>7. Play is often repetitive (plays same game the same way all the time).</td>
</tr>
<tr>
<td>8. Collects specific items either for play or just for storage</td>
</tr>
<tr>
<td>9. Difficulty transferring skills from one area to another.</td>
</tr>
<tr>
<td>10. Perfectionism in certain areas (wants things done in specific way).</td>
</tr>
<tr>
<td>11. Frustration is expressed in unusual ways.</td>
</tr>
<tr>
<td>12. Frequent tantrums</td>
</tr>
<tr>
<td>13. Feels the need to fix or rearrange things.</td>
</tr>
<tr>
<td>14. Transitioning from one activity to another is difficult.</td>
</tr>
</tbody>
</table>
APPENDIX VI

RESEARCH PERMIT

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471, 2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

Ref: No.

NACOSTI/P/15/2251/4721

John Ouma Onala
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Mothers involvement in early identification and intervention for children with autism in Nairobi County-Kenya,” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for a period ending 30th June, 2015.

You are advised to report to the County Commissioner, the County Director of Education and the County Coordinator of Health, Nairobi County before embarking on the research project.

On completion of the research, you are required to submit two hard copies and one soft copy in pdf of the research report thesis to our office.

Said Hussein
For: Director General/CEO

Copy to:

The County Commissioner
Nairobi County

The County Director of Education
Nairobi County.
CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do so may lead to the cancellation of your permit.

2. Government Officers will not be interviewed without prior appointment.

3. No questionnaire will be used unless it has been approved.

4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.

5. You are required to submit at least two (2) hard copies and one (1) soft copy of your final report.

6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.
THIS IS TO CERTIFY THAT:
MR. JOHN OUMA ONALA
of KENYATTA UNIVERSITY, 0-625
Nairobi, has been permitted to conduct
research in Nairobi County
on the topic: MOTHERS INVOLVEMENT
IN EARLY IDENTIFICATION AND
INTERVENTION FOR CHILDREN WITH
AUTISM IN NAIROBI COUNTY - KENYA
for the period ending:
30th June, 2015

Applicant's
Signature

Secretary
National Commission for Science,
Technology & Innovation