HYPERACTIVITY IN CHILDREN WITH PSYCHIATRIC DISORDERS AT DR. GEORGE MUKHARI HOSPITAL CHILD PSYCHIATRY UNIT

By

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DECLARATION

I declare that the dissertation hereby submitted to the University of Limpopo, for the degree of Masters of Medicine in psychiatry has not previously submitted by me for a degree at this or any other university; that it is my work in design and in execution, and that all material contained herein has been duly acknowledged.

Manyage T.J

30/09/2012

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ABBREVIATIONS

ADHD – Attention deficit hyperactivity disorder

CD – Conduct disorder

DRGMH – Dr George Mukhari Hospital

DSM IV TR – Diagnostic and statistical manual for mental disorders 4th edition text revision.

FASD – Fetal alcohol spectrum disorder

GMC – General medical condition

HIV – Human immune deficiency virus

MEDUNSA – Medical University of Southern Africa (University of Limpopo)

MR – Mental retardation

ODD – Oppositional defiant disorder

OPD – Outpatient department

SA – South Africa

USA – United State of America

ABSTRACT

Background

Child and adolescence mental health is a huge concern throughout the world, especially in developing countries were children and adolescence form majority of the population. Hyperactivity is one of the most common behavioural problems seen in child and adolescent psychiatric outpatient units. This behavioural problem may be accompanied by an underlying childhood psychiatric disorders.

Objectives

To determine the number of children with hyperactivity, establish gender differences, as well as profile of psychiatric disorders associated with hyperactivity at Dr George Mukhari Hospital child psychiatry outpatient unit.

Method

This was a retrospective descriptive study that included children who presented for the first time at Dr George Mukhari outpatient child psychiatry outpatient unit from January 2009 to December 2009. Children of all genders were equally considered and were within the age group of 3 to 14 years. Data of all children included was collected from the children's records. All the records of children with hyperactivity were separated from those without this behavioural problem. Gender differences as well as underlying psychiatric disorders were determined. Diagnoses made during the first assessment were based on Diagnostic and Statistical Manual of Mental Disorders, 4th edition text revision (DSM IV TR).

Results

A total of 49 new children who were assessed during the study period were included. Males were over-represented than females, and accounted to 79.49% and 20.4% respectively. Almost half of the children presented with hyperactivity (48.98%). Most of the children with hyperactivity were less

than 6 years (50%), followed by school aged group (41.67%) and then adolescents (8.33%). Majority of children with hyperactivity were males (83.33%) than females (16.67%).

The most common disorder associated with hyperactivity was mental retardation (62.50%), followed by attention deficit hyperactivity disorder (29.17%); and then mania due to HIV (4.17%) and sensorineural hearing deficit with hyperactivity (4.17%).

Conclusion

Hyperactivity is a common behavioural problem or complaint at Dr George Mukhari child psychiatry outpatient unit. It is common in males than females, and is associated with underlying childhood psychiatric disorders. Therefore, health professionals should be trained to identify behavioural problems, and community awareness considered since hyperactivity is associated with childhood psychiatric disorders. This is important because early identification and intervention will subsequently yield a good outcome.

CHAPTER 1

1. INTRODUCTION

Hyperactivity is one of the most common behavioural problems in children. Hyperactivity has been defined as a state of excessive action, lack of control, restlessness and destructive activity.[1,2] It is a symptom rather than a syndrome or disease entity. This behavioural problem is usually beyond normal limits, persistent and chronic in nature.[3,4]

Some parents describe hyperactivity of their children as being "naughty", and hope that it will spontaneously resolve with age. It is usually not a worrying factor until they start crèche or even school. They start to seek medical attention when hyperactivity starts affecting school performance. These children show poor language skills, low level of reading ability, disruptive and inattentive behavior.[4,5,6]

Behavioural problems, such as hyperactivity are also associated with social dysfunction in children. The disturbed interpersonal relationships at home also make a hyperactive child difficult to deal with.[3] Behavioural problems also cause significant burden to families and society because of lifelong consequences and economic costs. These symptoms (esp. in attention deficit hyperactivity disorder and conduct disorder) are associated with lower global functioning. They have shown to increase risk of problems during adolescence and adulthood. Problems that can be encountered are substance abuse, academic failure, antisocial behaviour; and in severe cases school dropout, heavy substance use and a criminal career and even mental illness.[7]

Hyperactivity and other behavioural problems like aggression are isolated symptoms, and may be associated with other disorders commonly seen in childhood and adolescents. Childhood psychiatric disorders that are likely to present with behavioural problems are attention deficit hyperactivity/impulsivity disorder (ADHD), conduct disorder, mental retardation (MR), learning disorder, autistic spectrum disorders, substance abuse, schizophrenia and other conditions like child abuse and chronic medical ilnesses.[2,7,8]

Childhood and adolescence mental disorders are common throughout the world. Worldwide prevalence of childhood mental disorders according to world health report (2000) was 20%. Various studies also reported the prevalence of childhood mental disorders to range from 14 to 20%. There are several population studies on prevalence of child and adolescent mental disorders in low and

middle income countries. A study done in Western Cape, SA revealed an overall prevalence of 17% for children and adolescence mental disorders.[9]

South African stress and health survey also demonstrated a high number of child and adolescence mental disorders (12.8%) on a population study.[10] A prevalence rate of 17.7% for children and adolescents (1- 15 years) was reported in Ethiopia. Overall prevalence rate in India and other developing countries was 6 to 15%.[11]

Childhood psychiatric morbidity is more serious in developing countries, because they have large proportion of children and adolescent population. These countries also have poor infrastructures and resources to deal with the problems. Many children with emotional, behavioural and developmental problems are therefore placed in public or mainstream schools without any screening. As a result, are at risk for school failure, emotional difficulties and negative adult outcome as compared to their peers. [11.12]

Some literature reported that 50% of adult psychiatric disorders had their onset before the age of 15, and therefore onset of mental illness before adulthood is characteristic of majority of adult psychiatric disorders.[11] Identification and intervention earlier can therefore substantially alter the course of childhood mental disorders into adulthood and this can reduce morbidity.

1.1. Study problem

Most communities do not seem to link hyperactivity to some psychological or psychiatric disorder going on. It is only when these children are assessed that a psychiatric disorder is found. Some parents are usually devastated and in denial of the diagnosis. A Romanian study on epidemiology of psychiatric disorders found that, out of children diagnosed with psychiatric disorder, only 10% of parents were concerned about their child's emotional or behavioural health.[13]

Early identification and intervention of childhood mental disorders is important in ensuring better outcome. This can minimise long term harm of children due to mental problems and overall health care burden and costs.[12]

This study will assist the Department of Health and social services into making sure that hyperactivity is addressed in communities as a problem that needs mental health intervention.

Primary health care practitioners and other health care workers in clinics will become more aware of behavioural problems of childhood. Awareness will result in early referrals to child and adolescent mental health units by primary health care providers as they are the point of entry to a health institution. This study will also identify the rate and distribution of common psychiatric conditions that are associated with hyperactivity or other behavioural problems.

1.2. Study questions

a) How common is hyperactivity at Dr George Mukhari Hospital child psychiatry outpatient clinic?
b) What is the gender difference in children presenting with hyperactivity at Dr George Mukhari hospital?
c) What are the common causes of hyperactivity in these children?

CHAPTER 2

2. LITERATURE REVIEW

2.1. Hyperactivity

Hyperactivity is manifested by fidgetiness, difficulty remaining seated when expected to do so, running and climbing in inappropriate places, difficulties playing quietly and often on the go as if driven by a motor.[2] It can also be associated with shortened attention span, distractibility and emotional instability.[3] Literature has demonstrated that hyperactivity in children is strongly associated with academic problems than aggression. However, antisocial behaviour and delinquency are associated with underachievement in adolescence.[14]

Childhood exposure to adverse conditions has a serious effect on physical and mental health over time. A 12 year follow-up study of preschool hyperactive children, revealed that hyperactive children more often come from families with adversity.[15] Other studies revealed several predictors of hyperactivity which includes negative parenting behaviours, maternal depression or parental history of mental illness, childhood aggressive symptoms, and childhood difficult temperament and poor socioeconomic status.[4]

Many South African (SA) children are living in harmful conditions. In 2007, SA general household survey was done for children aged 0-17 years. It was found that 68% of children lived below poverty line, 38% lived without any working adult, and only 35% of children resided with their biological parents. International studies like epidemiological research from USA, also found that childhood adversities can predict onset of mental conditions like externalising disorders, substance abuse, depression and anxiety disorders[16]

2.2. Childhood Disorders associated with hyperactivity

Some studies evaluated the demographic and diagnostic profile of child psychiatric outpatient units. They found that externalising disorders (e.g. attention deficit and hyperactivity disorder, and conduct disorder) were diagnosed more frequently than internalising disorders (depressive and anxiety disorder). Comorbidity of these disorders was also commonly seen.[17]

Childhood disorders associated with hyperactivity or differential diagnosis of hyperactivity include the following: Attention Deficit Hyperactivity Disorder (ADHD), mental retardation, autism, child abuse, learning disorder, conduct disorder (CD), epilepsy and other medical conditions.[2]

2.2.1. Attention Deficit Hyperactivity Disorder (ADHD)

Attention deficit hyperactivity disorder is a chronic mental health disorder with distinct behavioural manifestation in childhood, adolescence, and adulthood.[18] It present with persistent pattern of inattention, and/or hyperactivity and impulsivity. Hyperactivity is the most common presenting symptom for preschool children with ADHD. Inattention on the other hand, is more apparent during school age years because of increased academic demands. Hyperactivity and inattention problems in children with ADHD are more frequently displayed and severe, as compared to other individuals of the same level of development.[2,19]

Diagnostic criteria for ADHD according to DSM IV, covers many activities from a school setting. Studies have shown that children with ADHD exhibit age inappropriate features of hyperactivity and impulsivity during physical activities as well.[12]

Diagnosis of ADHD is difficult when children show hyperactivity prior to school age and in the first year of school. The disorder is generally more prevalent in males than females.[2,22] Normal boys tend to show higher level of activity than school setting allows, and can only mean that the child hasn't mastered the facility. Therefore, diagnosis should be made from second to third grade.[23]

Attention-Deficit hyperactivity Disorder is the most common child psychiatric disorder in Europe and the United States of America (USA), affecting 3 – 10% of primary school children. Studies using DSM IV TR criteria have suggested that the prevalence of ADHD is also high in many non-USA children as in USA children. Geographical location plays a limited role in the variability of ADHD prevalence worldwide. The variability is due to differences in methodological characteristics of studies. A worldwide prevalence pooled estimate of ADHD is 5.29%.[20,21]

Studies done in Limpopo Province (South Africa) also found that the prevalence and sex ratio of ADHD is similar to those reported in western countries. This suggests that ADHD is caused by neurobiological process which is probably due to genetic factors, and not cultural differences.[22]

2.2.2. Mental Retardation

Mental retardation (MR) is characterised by sub-average intellectual functioning with onset before age 18 years. It is also referred as intellectual disability. There is global impairment in intellectual development and adaptive functioning. It can be classified according to severity as mild, moderate, severe, profound and mental retardation severity unspecified.[2]

Prevalence is estimated to be 1% of general population. Hyperactivity is one of the most common behavioural problems seen in mental retardation.[2]

A study was done on prevalence of intellectual disability in rural South African children aged 2 to 9 years in Bushbuckridge. The prevalence intellectual disability was 35.6/1000 children, with mild intellectual disability more common than severe intellectual disability.[24]

2.2.3. Learning disorder

A diagnosis of learning disorder can be made when intellectual impairment is not global, but is in specific areas of intellectual functioning. It can either be reading, mathematics or written expression. Prevalence of learning disorder is 2% to 10%. Although there is a clear distinction between core symptoms of ADHD and learning disorder in terms of diagnostic criteria, studies have shown a clear link between the two disorders in terms of symptoms. Children with learning disorder may present with hyperactivity, low self-esteem, emotional instability, lack of social skills and interpersonal problems. Research demonstrated that 24 to 54% of children with learning disabilities have behavioural problems.[2,12]

2.2.4. Autistic spectrum disorders

It is the presence of abnormal or impaired development in social interaction, communication, and restricted repetitive and stereotyped patterns of behaviour and interests. Disturbance manifests by delayed functioning in these areas prior to three years of age.[25]

Prevalence has been 1 in 150 in the past decade. Risk factor of autism among siblings is 4% to 10%. Children with an autistic disorder frequently have emotional and behavioural problems along with features of autism. They have a range of behavioural symptoms which include hyperactivity, short attention span, impulsivity, aggressiveness and self-mutilating behaviour. Children with autism can have various comorbidities such as ADHD, obsessive compulsive disorder, bipolar disease and schizophrenia.[2,25]

2.2.5. Child Abuse

Child abuse is a wide spread problem. It can be in a form of deliberately neglecting a child, physical, sexual and psychological abuse. Causes of child abuse can be due to multiple factors,

e.g. parents who abuses substances, those with history of mental illness and poor social support systems.[8,26]

Consequences of child abuse are severe and can affect children socially, academically, physically and can persist into adulthood.[1]

Stress of chronic abuse causes hyper-arousal response by certain areas of the brain. This may result in hyperactivity, sleep disturbance, and conduct disorder, learning and memory difficulties.[23,24]

Studies suggested that child neglect and abuse between ages 4 and 12 years has an effect on onset of mental disorders rather than its course. Adverse childhood experiences have been linked to increase risk of mental problems, substance abuse and suicidal behaviours in adulthood.[27]

2.2.6. Epilepsy

Epilepsy is the most common childhood neurological disorder affecting 0.5% to 1% of children younger than 16 years. It affects approximately 1% of the population. The behaviour and cognitive functioning are affected negatively in substantial number of children. The prevalence of psychiatric co-morbidity in epilepsy is higher than in children who have other chronic health conditions.[15] Children with benign childhood epilepsy such as complex partial seizures and frontal lobe epilepsy are likely to show behavioural problems such as hyperactivity. [28]

Research has showed that symptoms of ADHD are significantly more prevalent in patients with new onset epilepsy than healthy controls. It was also found that symptoms of ADHD are seen before diagnosis of epilepsy is made in 82% of cases.[29]

2.2.7. Conduct disorder and oppositional defiant disorder

Oppositional defiant disorder (ODD) is a pattern of negativistic, defiant, disobedient and hostile behaviour towards authority figures lasting at least 6 months. Prevalent rate is 2.6% - 15.6% in community samples, and from 28% - 65% in clinical samples. Developmental progression from ODD to CD was established in DSM IV criteria. Recent studies have suggested that ODD is not merely a predisposing factor of conduct disorder, but a starting point of other mental disorders like anxiety and depression.[30]

Boy and girls with symptomatic ODD had been found to have increased risk of exhibiting emotional symptoms, hyperactivity and peer problems as compared to non - ODD children. Munkold and colleagues found that 73.0% of boys with ODD had hyperactivity symptoms, and only 14.3 % of non- ODD boys had hyperactivity. For girls, 46.3% had emotional problems as compared to 10.3 % of non – ODD girls. Therefore, ODD is associated with more hyperactivity problems in boys than girls.[30]

Hyperactivity is also a known risk factor for antisocial behaviour. Thus, early intervention would lead to reduction of long term consequences of the disorder and would be beneficial to individuals, families and society.[14]

2.2.8. Fetal alcohol spectrum disorder (FASD)

Heavy prenatal alcohol exposure can results in neuro-behavioural deficits that are potentially devastating. FASD emphasises the continuous nature of the effect of prenatal alcohol exposure. Exposure to alcohol in utero is associated with behavioural problems and high rates of psychiatric disorders. Hyperactivity and attention deficits have been frequently observed in those individuals with heavy prenatal alcohol exposure. Studies have also suggested that more than 60% of children

exposed to alcohol will have high rate of ADHD and other hyperkinetic disorders, than typically developing children.[31]

2.2.9. Other psychiatric and medical conditions

Depressive and anxiety disorders should be ruled out in children with hyperactivity. These children can present with psychomotor agitation, disruptive behaviour, poor concentration that can mimic ADHD. Bipolar disorder in childhood can present with increase distractibility and hyperactivity as well. Epidemiological studies of total population also suggested that children who later developed schizophrenia were more likely than controls to show social, emotional and behavioural problems in childhood.[19]

Research has showed that children with chronic illness are at high risk of emotional and behavioural problems, and diagnosed with mental illness more frequently than those without a chronic illness. Emotional and behavioural problems such as hyperactivity and attention problems have been seen in children with perinatal HIV exposure and HIV infection. Children with hyperthyroidism, hearing deficits and lead poisoning can also mimic ADHD like symptoms[19,32]

2.2.10. Comorbidity of disorders

Some of the childhood disorders coexist. Comorbidity of disorders results in severity and persistence of symptoms. Tsotsika and colleagues did a study on behavioural problems of 5 years old children with hyperactivity and intellectual disability. They established that hyperactivity and conduct problems were higher in children with both autism and intellectual disability, than those with autism or intellectual disability only. Evidence suggested that the greater the number of coexisting disorders, the poorer the outcome. Autism and ADHD commonly co-occur. There is also evidence that ADHD and conduct disorder commonly coexist as well.[12.33]

CHAPTER 3

3. METHODOLOGY

3.1. Aims and Objectives

3.1.1. Aim

To establish number of children with hyperactivity problem, evaluate gender differences and underlying childhood psychiatric disorders at Dr George Mukhari Hospital child psychiatry outpatient unit.

3.1.2. Objectives

a) To determine the number of children with hyperactivity at Dr George Mukhari Hospital child psychiatry outpatient unit.
b) To determine any gender and age group differences in children who presented with hyperactivity symptoms.
c) To determine the profile of childhood psychiatric disorders associated with hyperactivity.

3.2. Study Design

A retrospective descriptive study was conducted on children seen over a period of one year (January 2009 to December 2009). The data collected during the period of study assisted to determine the profile of hyperactivity, as well as common psychiatric disorders associated with hyperactivity. Data was also used to establish gender differences in children with hyperactivity symptoms. Psychiatric diagnoses were according to Diagnostic and Statistical Manual of mental disorder text revision (DSM IV-TR).

3.3. Study Population

Study population used was selected according to the following criteria:

- Only children who were seen for the first time at Dr George Mukhari Hospital child psychiatry unit within a year of study (January to December 2009).
- Only children between the age of 3 and 14 years seen at outpatient psychiatric unit were included in the study.
- Both male and female children included.
- Hyperactivity symptoms should have caused impairment in schooling and social functioning of children.
- Psychiatric disorders associated with hyperactivity were according to DSM IV TR criteria.

3.4. Sample size

A sample size comprised of all new children seen at Dr George Mukhari Child Psychiatric outpatient clinic from January 2009 to December 2009.

An estimated sample size was 90 children seen at our psychiatry outpatient from January 2009 to December 2009. However, only 80 files were retrieved by a qualified clerk. Out of 80 files, 11 files belonged to children above age of 14 years. The other 20 files had incomplete or missing information. Therefore, a sample size used in this study comprised of 49 files of children.

3.5. Data Collection

At least two new cases are seen every Wednesday. Outpatient unit does not open on holidays. Patients were seen as per their appointment date. Majority of children were initially seen by psychologists who then referred to psychiatrists. A medical work up was done to exclude any physical problems. They were then seen by a psychiatry registrar and a qualified psychiatrist. Diagnoses were made according to DSM IV-TR. The files were safely stored in psychiatry outpatient unit by qualified clerks.

Instrument used in this study was the patient's records. A study was conducted using 49 files of children who presented during the time of study. Thirty nine were males and 10 females as shown in Table 1 below.

Table 1: Total number of children who presented at DR GMH child psychiatry unit.

Gender	**Frequency**	**Percentage (%)**
Females	10	20.41
Males	39	79.59
Totals	**49**	**100**

Files of children, who presented with hyperactivity as one of the complaints, were separated from files of those without hyperactivity. The files of those children with hyperactivity were separated according to gender. Files were later divided according to age distribution. The following age groups were used, 3 - 6, 7 - 10, and 11 – 14. Psychiatric disorders associated with hyperactivity were also determined.

Information from the files was transferred to a data collection sheet. Data collection sheet was compiled by the researcher for the purpose of this study.

Data collection sheet was comprised of the following sections:

Section A: Socio – Demographic Data.

- This section included parameters of age and gender.
- It also gave an overview of the family structure.

Section B: Clinical Data.

- Clinical symptoms and duration of symptoms at first presentation was established.
- Signs of hyperactivity according to DSMIV TR also established.
- Family history of mental illness and history of childhood psychiatric disorder: ascertained any genetic predisposing factor to a mental disorder.
- Developmental problems/milestones: was used to determine if developmental problems had an influence on mental disorder which will help in the diagnosis.
- Past medical history: assist to establish whether hyperactivity symptoms are due to a medical problem or purely a mental problem.
- Previous consultations to a paediatric unit or family practitioner: exclude any other medical condition.
- History of substance abuse: helped ascertain whether hyperactivity symptoms are due to use of substances.
- Current psychiatric diagnosis: was made according to DSMIV TR criteria.
- Current medication: helped ascertain whether treatment is aligning with psychiatric diagnosis

3.6 Data Analysis

Data collected in the study was captured in a computer database. Data capturing was verified and validity checks conducted. The statistical analysis was mainly of a descriptive nature. The incidence of each type of psychiatric disorder was calculated as a percentage out of the number of children in the sample, together with a 95% confidence interval. All statistical procedures were performed on SAS, Release 9.2, running under Microsoft Windows.

3.7 Reliability

The patient's files are confidential, and are kept safe away from the general community by qualified clerks. All patients have confidential files which are kept in the department. The information in the files is assumed to be accurate since is a legal documents. The same data collection sheet was used for all patients. If the same subjects are used at another time and same condition, they will yield similar results.

3.8 Validity

Psychiatric diagnosis made is standardized by DSM-IV TR criteria of mental disorder which is internationally recognized. The study was conducted in the academic institution that receives patients from a large catchment area.

Registrars who attend to these patients are under supervision of qualified psychiatrists. Patients are further discussed in a formal meeting with all psychiatric registrars, consultants and head of the department. The above measure will ensure that validity is maintained.

3.9 Bias

During the study and data collection all efforts were made to ensure that, records are properly retrieved and files are not mixed. Problems of missing files, incomplete records and misdiagnosed cases contributed to some form of bias. The study also has some form of bias because only patients seen at Dr George Mukhari Hospital were considered for the study. However, there is no reason to suspect that children seen in 2009 are different from children seen in any other years.

3.10 Ethical consideration

1) Permission was requested and obtained from the superintendent of Dr George Mukhari hospital for the use of facilities to complete the study.
2) Permission to conduct the study was also requested and obtained from the research ethics and publication committee of the University of Limpopo.
3) High level of confidentiality was maintained throughout the study by using patient's file numbers instead of patient's name. All data and information obtained from the files was used for this study only.

3.11 Budget

This research was self-sponsored and no other funding has been received for the study. Costs incurred were for data collection, stationary, printing and binding. Budget used was two thousand rand.

3.12 Time frame

The estimated time frame of the study was 1 year, which involved literature search (March 2011 to December 2011), data collection (April - June 2011), data analysis (August to September 2011) and write-up of the dissertation (November 2011 to May 2012).

CHAPTER 4

4. RESULTS

The study involved data of children from 3 to 14 years who presented at Dr George Mukhari hospital child psychiatry outpatient unit within the time of study. The study conducted was comprised of 49 children with a mean age of 8.24 years (± 2.98).

4.1. Determining gender differences of all children seen at DR GMH child psychiatry unit

All the files of children who were included in the study were subsequently divided according to gender as shown in Table 1 above.

Thirty nine children were males, and accounted to 79.59% of the total population. Female on the other hand were only 10, accounting to 20.41% of the total population.

4.2 Age distribution of all children who presented at DR GMH child psychiatry unit

Records were divided according to age groups as shown in Table 2 below. There were three age groups used and they yielded different results.

Table 2: Age distribution of children seen at Dr GMH child psychiatry unit.

Age Group	Frequency	Percentage (%)
3 - 6	14	28.57
7 – 10	24	48.98
11 – 14	11	22.45
Totals	**49**	**100**

Majority of children were between 7 – 10 years (48.98%) of age. They were followed by children of 3 to 6 years (28.57%) category. Eleven to fourteen years category accounted only 22.45%.

4.3 Age distribution according to gender.

Age distribution according to gender yielded the following results as shown in Table 3 below. There were 39 males out of 49 children who formed part of this study. Only 10 females formed part of the study.

Table 3: Age distribution of all children according to gender

Age Group	Females		Males	
	Frequency	Percentage	Frequency	Percentage
3 – 6	2	20	12	30.77
7 – 10	6	60	18	46.15
11 – 14	2	20	9	23.08
Total	**10**	**100**	**39**	**100**

More male children were within the age group of 7 – 10 years (46.15%) as seen in Table 3 above. Age group of 3 – 6 year olds had 12 children (30.77%). Only 9 males were seen in the age group of 11 – 14 years (23.08).

Only ten females formed part of the study. Six children (60%) were within the age group of 7 – 10 years. However, 3 - 6 and 11 – 14 age groups each accounted to 20% of the females.

4.4 Determining reasons for referral

Children who visited psychiatry outpatient clinic for the first time were of 49 in number. This study determined that the reason that led to most of the referrals to child psychiatry outpatient unit was hyperactivity problems (48.98%) as reflected in Figure 1 below.

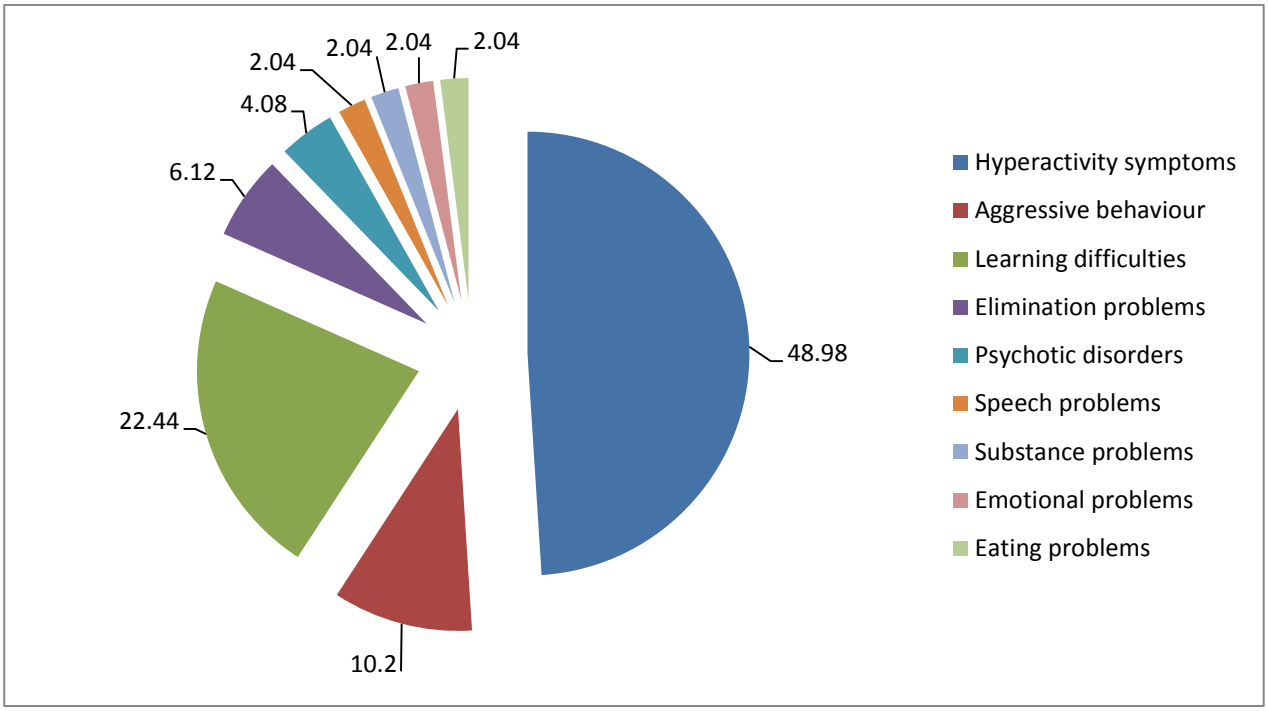

Figure 1: Establishing reasons for referral in children seen at Dr George Mukhari child psychiatry outpatient unit

Hyperactivity symptoms were not found in 25 children (51.02%) who formed part of the study. Other presenting symptoms were divided into categories.

Aggressive behaviour (10.2%) included temper tantrums, bullying, stealing and lying. Learning difficulties (22.44%) contributed to a significant number of children who came to OPD. The other presenting complains were elimination disorders (encopresis, enuresis), psychotic symptoms, speech problems, substance use, emotional and eating problems.

Children were also divided according to age groups. Majority of children who presented with hyperactivity were of 3 – 6 years category as shown in Figure 2 below.

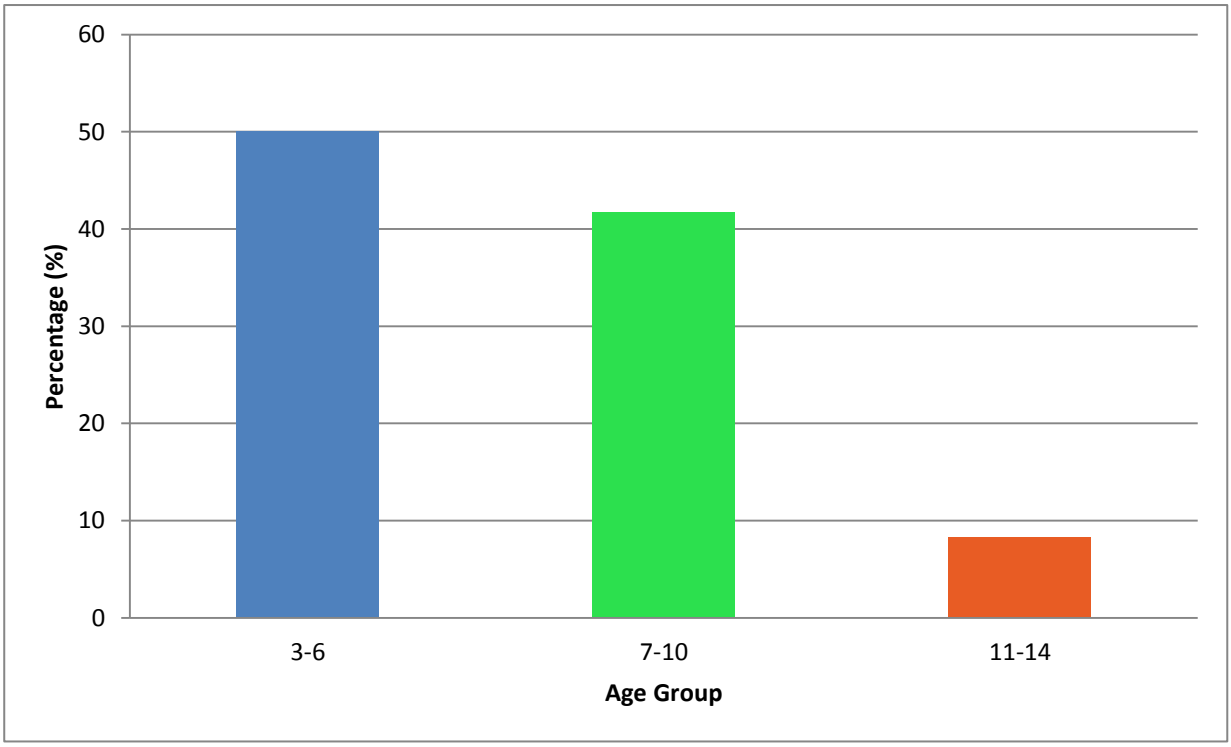

Figure 2: Age distribution of all children who presented with hyperactivity.

Three to six years category contributed to 50% of all children found with hyperactivity symptoms. Seven to ten years category accounted to 41.67% of all children with hyperactivity. However, 11 – 14 years category had the least number of children (8.33%) who presented with hyperactivity.

4.5 Gender differences in children who presented with hyperactivity.

Out of 24 children who presented with hyperactivity symptoms, 4 children (16.67%) were females as seen in the Figure 3 below.

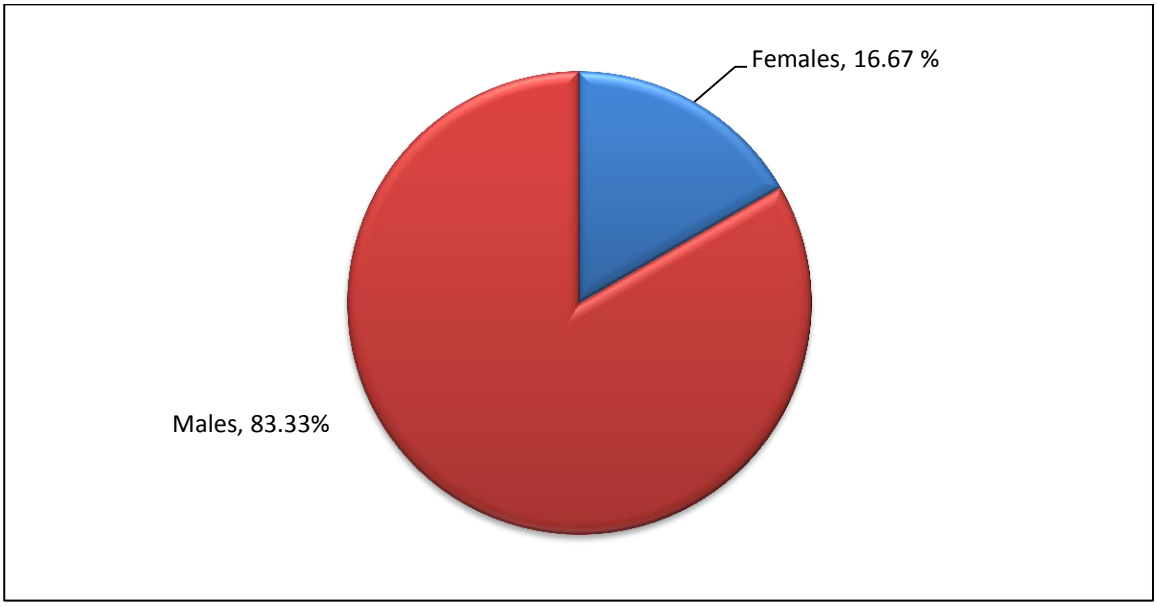

Figure 3: Determination of gender differences in children with hyperactivity

Majority of children who presented with hyperactivity were males. They accounted to 83.33% (20 patients) of all children with hyperactivity.

4.6 Determining age distribution in males and females with hyperactivity symptoms.

Males and females children were divided according to age groups as shown in Table 4 below.

Table 4: Determining age distribution according to gender in children with hyperactivity symptoms.

Age Group	Females		Males	
	Frequency	**Percentage**	**Frequency**	**Percentage**
3 – 6	2	50	10	50
7 – 10	2	50	8	40
11 - 14	0	0	2	10
Totals	**4**	**100**	**20**	**100**

Majority of male children with hyperactivity belonged to 3 – 6 age group (50%). They were followed by 7 – 10 age group, were 8 children had hyperactivity. This accounted to 40% of all males who presented with hyperactivity within this age range. Only 2 children were within 11 – 14 age groups, and contributed to 10% of males with hyperactivity.

Female children also presented with hyperactivity as shown in Table 4 above. Two female children belonged to a category of 3 – 6 age distribution, and accounted to 50% of females with hyperactivity. The other two were of 7 – 10 age groups, and accounted to another 50%. No children were found within 11 – 14 age groups.

4.7 Profile of childhood psychiatric disorders

Profile of childhood psychiatric disorders of all children seen during the time of study was established as shown in Figure 4 below.

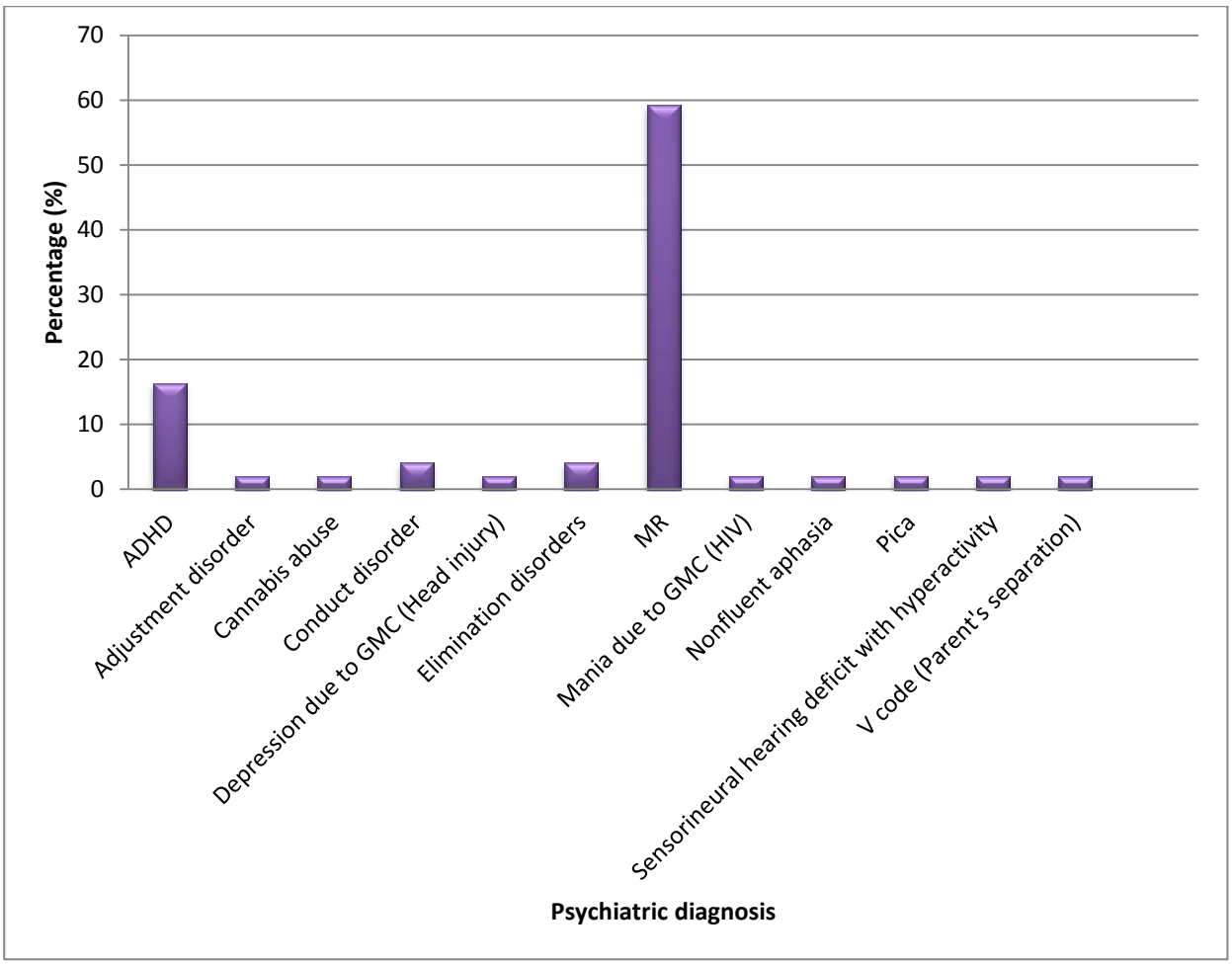

Figure 4: Profile of childhood psychiatric disorders of all children seen at Dr GMH child psychiatry unit.

Out of 49 children, 29 (59.33%) had a diagnoses of mental retardation as shown in figure 4 above. Children with ADHD (16.33%) also contributed to significant number of those who presented at Dr George Mukhari Hospital child psychiatry unit.

Conduct disorder was diagnosed in 2 children (4.08%). Elimination disorders (encopresis and enuresis) were also reported and contributed to 4.08%. Cannabis abuse (2.04%) was also one of the conditions identified. Some children in the study were diagnosed with emotional disorders like depression and V code (parent's separation). Some children who came for consultation had medical conditions. These children were diagnosed with non-fluent aphasia, mania due to HIV and sensorineural hearing deficit with hyperactivity as shown in Figure 4 above.

4.8 Association of mental retardation with behavioural problems

Out of 29 children with mental retardation, 15 (51.78%) had a diagnoses of mental retardation (intellectual disability) with hyperactivity as a behavioural problems as shown in Figure 5 below.

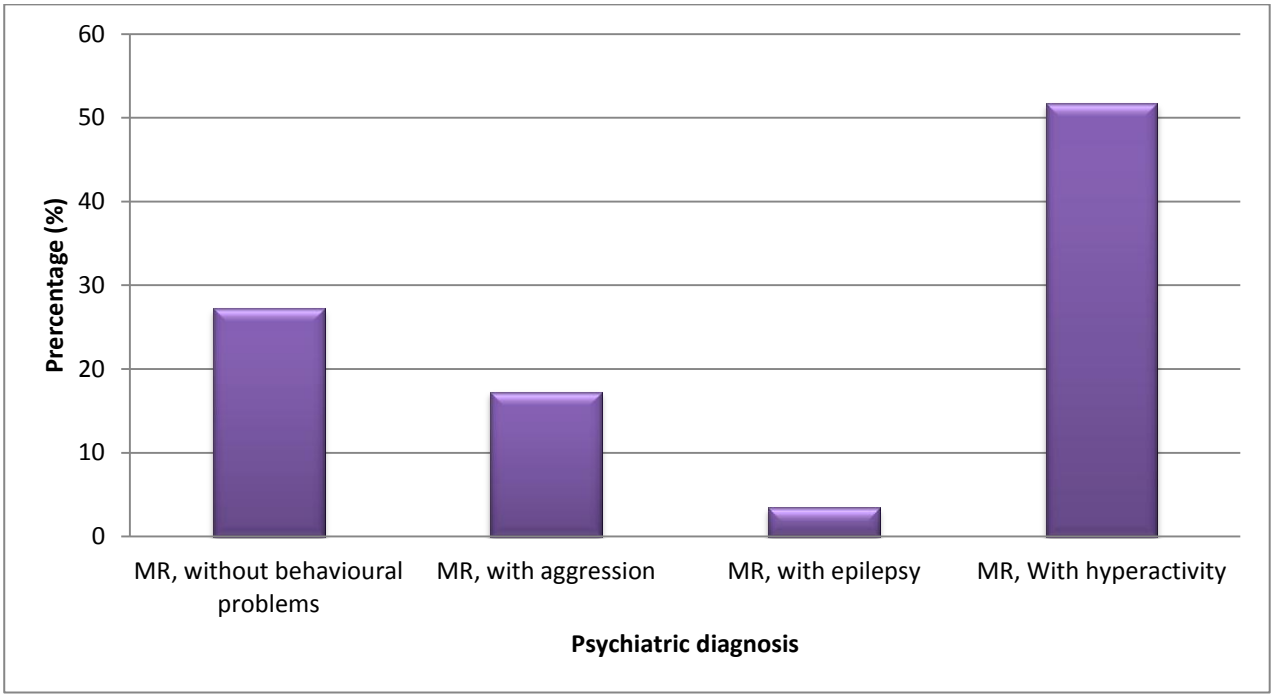

Figure 5: Determining behavioural problems in children with mental retardation

Mental retardation without behavioural problems contributed to 8 (27.58%) of all children seen during the study.

Mental retardation with aggression as a behavioural problem was seen in 5 children, and accounted to 17.24% of cases. One child (3.45%) had mental retardation with epilepsy.

4.9 Profile of childhood psychiatric disorders in children with hyperactivity.

The study also determined the profile of psychiatric disorders associated with hyperactivity as seen in figure 5 below.

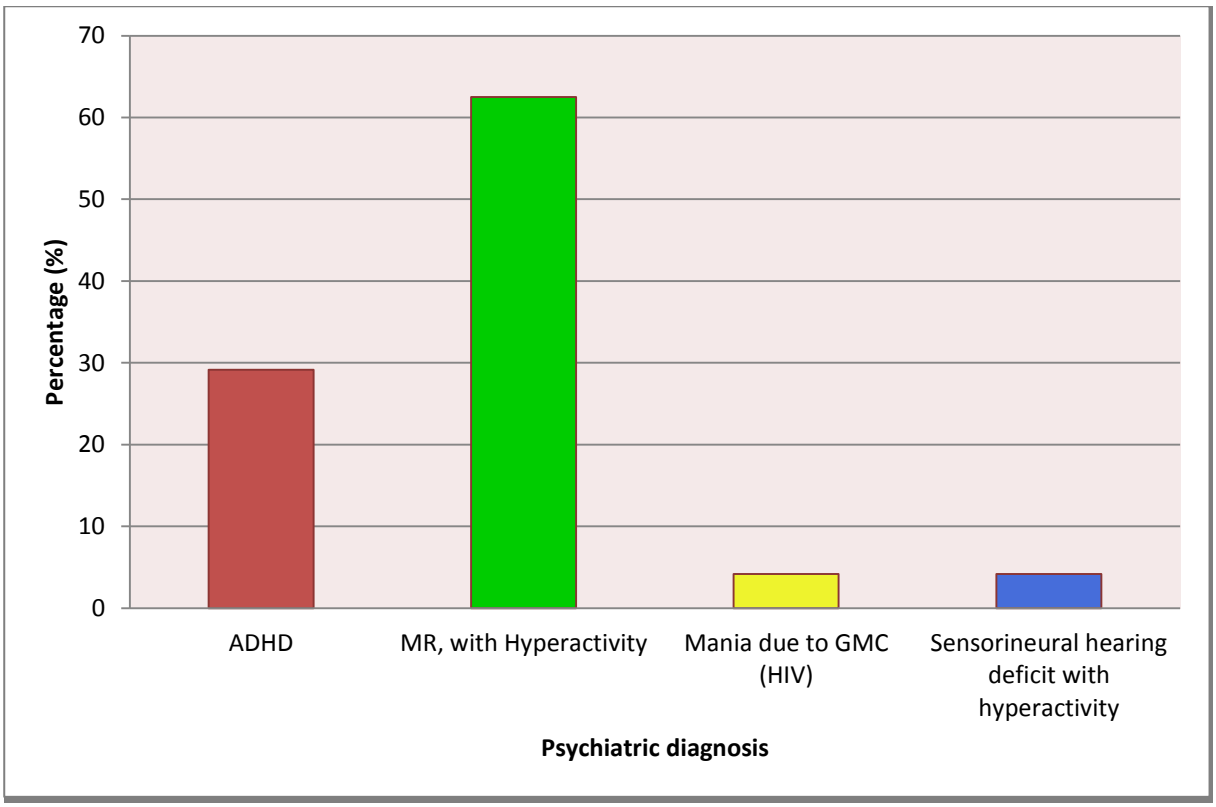

Figure 6: Childhood psychiatric disorders associated with hyperactivity.

Mental retardation with hyperactivity demonstrated to be the most common disorder associated with hyperactivity. From 24 children who presented with hyperactivity, 15 children had mental retardation (intellectual disability). This accounted to 62.50% of all hyperactive children who formed part of the study as shown in Figure 6 above.

Intellectual disability was followed by ADHD (7 patients), which accounted to 29.17% of all children with hyperactivity symptoms. The remaining 2 conditions were due to medical problem. Mania due to HIV with hyperactivity as well as sensorineural hearing deficit with hyperactivity contributed to 4.17% each.

4.10 Gender differences in psychiatric disorders associated with hyperactivity.

All females who presented with hyperactivity symptoms had a psychiatric diagnosis of mental retardation (intellectual disability) as illustrated in Table 5 below.

Table 5: Gender differences in psychiatric disorders associated with hyperactivity**.**

Gender	Psychiatric diagnosis	Frequency	Percentage
Female	MR, with hyperactivity	4	100
Male	ADHD	7	35
	MR, with hyperactivity	11	55
	Mania due to HIV	1	5
	Sensorineural hearing deficit with hyperactivity	1	5

Mental retardation with hyperactivity accounted to 55% of all males with hyperactivity as shown in the Table 5 above. Attention deficit hyperactivity disorder was also predominant. All ADHD patients with hyperactivity were males. They contributed to 35% of males who presented with hyperactivity symptoms. Mania due to HIV and sensorineural hearing deficit with hyperactivity each contributed to 5% of males with hyperactivity symptoms.

4.11 Age distribution of psychiatric disorders associated with hyperactivity

Most children with ADHD (41.67%) were within 3 - 6 age groups as shown in Table 6 below.

Table 6: Association of psychiatric disorders with hyperactivity and age distribution

Age	Diagnosis	Frequency	Percentage	Total percentage
3-6	ADHD MR, with hyperactivity	5 7	41.67 58.33	**100**
7-10	ADHD MR, with hyperactivity Sensorineural hearing deficit with hyperactivity	2 7 1	20 70 10	**100**
11-14	MR, with hyperactivity Mania due to HIV	1 1	50 50	**100**

Only 2 children who had ADHD (20%) were within the age group of 7 - 10. However, mental retardation was the most common disorder between 3-6 and 7-10 age groups. Children beyond 10 years were only two, and had mental retardation with hyperactivity and mania due to HIV.

CHAPTER 5

5. DISCUSSION

Various studies have been done on the prevalence of mental disorders in children and adolescence worldwide.[11] More studies are now been done on childhood mental health in South Africa and other developing countries in Africa. This is a retrospective descriptive study which focused on the presence of hyperactivity symptoms, gender differences, and psychiatric disorders associated with hyperactivity in those children who presented for the first time at Dr George Mukhari Hospital child psychiatry unit in 2009.

Distribution of children in terms of age and gender

The study comprised of 49 children between 3 and 14 years of age. Mean age in which most families brought their children was 8.24 years (± 2.98). Early intervention of childhood mental disorder is crucial for better outcome. Both African and international studies have shown that late intervention can lead to scholastic impairment, adolescence and adult problems.[27] Average age in which most children were seen for the first time seem to be similar to some studies, however different age distributions and study populations used by different researchers have a major impact on the results.

The relationship between age and gender has been found to differ for different disorders and populations. This study also revealed that more males (79.59 %) presented for clinical assessment as compared to females (20.41%). This is consistent with the studies that suggest that more boys are brought or referred to mental health services than girls. Al shabanti and colleagues did a study on profile of child and adolescents psychiatry in a child psychiatry clinic, and found that males were overrepresented by at least 65%.[6] A South African study on profile of children seen for the first time in outpatient department (OPD), also reported an overrepresentation of male over females.[34] Researchers have always been concerned about the gender gap in mental health access and research. This was meanly seen in children who presented with ADHD symptoms.[35] One study suggested that, it is because most childhood onset disorder are common in males, whereas adolescent onset disorders are common in females.[11]

In this study a similar picture was seen on both sexes, where majority of children presented for assessment within an age group of 7 – 10, followed by 3-6, and few children within age 11 - 14.
A South African study also reported a similar trend in age distribution and presentation as is in this study.[34] This study is also consistent with a study done in India on 4 – 14 year olds. The highest prevalence of psychiatric disorder was within 6 - 7 and 10 - 11 age groups. There are suggestions that presentations at these ages could relate to scholastic demands and more expectations from the child.[11,37] In contrast to this study, some literatures reported that majority of children presented for the first time in adolescence than preschool and school age group.[6,37]

Determination of children with hyperactivity

More emphasis was placed on children who presented with hyperactivity symptoms. Almost half of the children presented with hyperactivity (48.98%), and the other 51.98% of children presented with other problems as reflected in Figure 1. Studies have suggested that disruptive behaviour is the most common symptom on presentation to child psychiatry outpatient unit.

Other studies reported that children are often referred to mental health services given the frequent and persistent nature of hyperactivity and its impact on others.[3,4] This can also be supported by other studies that have reported that hyperactivity exist in 30 – 50% of children seen in psychiatric outpatients units.[6] A study in Oman, found that hyperactivity was the most common behavioural problem, and accounted to 60% of children who presented at child psychiatry clinic.[6]

Age and gender differences in children with hyperactivity

Although majority of children (male and females) presented at Dr GMH child outpatient unit within the age group of 7 – 10, most children with hyperactivity were within the age group of 3 – 6 (50%). Literature has suggested that high levels of disruptive behavioural problems are common during preschool years, and frequently decline after this age. Aggression and hyperactivity symptoms from preschool years which do not decline may indicate development of a mental health problems.[38] Romano and colleagues also demonstrated the development of hyperactivity symptoms in population based sample of 2 -7 year olds. They found that hyperactivity symptoms were declining with age, and only 7.2% of children continue to have persistent hyperactivity symptoms over time.[4]

Small percentage of children with hyperactivity presented after the age of 10 years. Studies have shown that hyperactivity symptoms decrease in adolescence. A study was done by Sibley and colleagues on diagnosis of ADHD in adolescence. Few adolescents met criteria for symptoms of hyperactivity and impulsivity, and significant number of them had functional impairment. There is also a proposal in DSM V to reduce the number of symptoms on diagnostic criteria from 6 to 4 in order to meet criteria for hyperactivity and impulsivity in adolescents.[18,36]

Majority of children who presented with hyperactivity were males (83.33%) as compared to females (16.67%). This is consistent with studies that suggest that hyperactivity is common in males than females. However, this might also be influenced by number of children who are brought to child psychiatry clinics. Literature also suggested that referred children with hyperactivity are usually males between the age of 7 -11.[3] Therefore overrepresentation of males over females might have contributed to these findings.

No female children presented with hyperactivity after the age of 10. This might have been influenced by a small sample size. However, this is consistent with studies that suggest that behavioural symptoms are common in males and are of early onset. Depression, anxiety and other stress related disorders are usually common in females and are of late onset during adolescence.[11] This study was in contrast with one study that showed that behavioural symptoms, disappears or decrease quickly in boys than girls after the age of ten years.[36]

Profile of childhood psychiatric disorders

In this clinical study, mental retardation (59.33%) was the most common diagnosis followed by ADHD (16.33%). In developing countries, learning difficulties is one of the most common complain to child psychiatry units. However, one SA study demonstrated that ADHD was the most common disorder in children seen for the first time in an outpatient unit, followed by learning disorder and mental retardation.[34] Other studies have also shown that disruptive behavioural disorders such as ADHD and conduct disorders are regarded as the most common reason for referral of children and adolescents to mental health clinics. These behavioural problems are common in early childhood and are becoming more prevalent.[12,39]

Children with conduct disorder were also found in this study. Apart from ADHD, Faravelli and colleagues also found conduct disorder and separation anxiety disorder to account to a significant

number of childhood disorders established in his study. Early identification and intervention is important, because conduct problems at ages 7 – 9 years are associated with increased risk of antisocial personality disorder, poor educational and occupational achievements, early parenthood, substance and emotional disorders in adulthood.[14,39,40] However, some literature showed that a small proportion of children with conduct disorder had good adaptation to adulthood.[40]

Cannabis abuse was also a problem in children. Prevalence of substance related disorders in South African study has been found to be 2.2% in child and adolescence, and was associated with failure to finish high school.[10]

Other conditions such as emotional disorders, elimination disorders, pica, and language problems, V code (parent separation) were seen in some children as shown in Figure 4. Therefore, it is important to identify these children and refer them for early intervention, and maybe prevent the course of the disorder into adulthood. One study suggested that parent's separation is a major concern, especially in developing countries were a child can be raised by many people within the family at different times (grandparents, uncles, and aunts).[34]

Association of mental retardation with behavioural problems

Majority of children who presented with mental retardation had hyperactivity (51.78%) as a behavioural problem. They were followed by mental retardation with aggression (17.24%).

Al Shabanti and colleagues conducted a study on profile of child and adolescent psychiatry in Oman, and reported that hyperactivity (60%) was the most common behavioural problem, followed by aggression (49%), stealing (25%) and lying behaviour (22%).[34] Another study also reported mental retardation with behavioural problems (36.14%) as the most frequent diagnosis, then followed by epilepsy with behavioural problems, and then attention deficit hyperactivity disorder (10.53%).[37]

Profile of childhood psychiatric disorders associated with hyperactivity

Mental retardation contributed to majority (62.50%) of children with hyperactivity. Literature suggested that intellectual disability among children and adolescents is associated with comorbid

behavioural problems. The prevalence of behavioural problems in children with intellectual disability in developed countries has been documented to be from 31% - 41%.[41]

There are few studies addressing behavioural problems associated with intellectual disability among children in Nigeria and sub-Saharan Africa. A study was done in Cape Town, SA which aimed at describing the extent and nature of behavioural and emotional problems in children attending special school in the area. According to their findings, 31% of children with intellectual disability had behavioural and emotional problems.[42]

ADHD was the second most common disorder in children with hyperactivity. Number of children who presented with hyperactivity was reduced with age. Studies have shown that hyperactivity and impulsivity are more frequent in preschool children with ADHD than symptoms of inattention. In adolescents, symptoms of inattention and cognitive impulsivity are more intense, whereas symptoms of hyperactivity start subsiding.[2,13,43]
Findings in this study were in contrast with a study done by Vogel and Holford who reported ADHD as the most common disorder associated behavioural problems.[35]

Hyperactivity associated with chronic illness was also found in this study. Mania due to HIV was one of the physical illnesses as shown in Figure 5. Various studies have also reported high rates of psychiatric disorders, emotional and attention problems in children and adolescence with HIV than their normal peers. One study found that 7% of children with HIV had behavioural problems that included hyperactivity (19%), impulsivity / hyperactivity (20%) and conduct problems (14 %). Some of the disorders reported in children with HIV were mania (1%), ADHD (12%), ODD (5%) and depressive disorder (1%). Therefore, HIV/AIDS has a major impact on mental wellbeing of children.[32,44,45]

One child with sensorineural hearing deficit presented with hyperactivity in his study. There is evidence that children with poor vision and hearing problems might present with ADHD - like symptoms.[19] Prevalence of disabilities among children under 10 years was found to be high in Kwazulu Natal (South Africa). The most prevalent disabilities found in that Kwazulu Natal study were learning disabilities, followed by cerebral palsy and hearing loss.[46]

Gender differences of psychiatric disorder associated with hyperactivity

All ADHD children who presented with hyperactivity were males. Many studies have suggested that ADHD is common in males than females. International studies have revealed male to female ratio of ADHD to be 3:1 in population based studies, and 5-9:1 in clinical studies. Gender difference in ADHD has been suggested to be due to different expression of disorder in boys and girls.[47]

Studies have shown that females with ADHD are less hyperactive, impulsive and aggressive as compared to males. Therefore, parents and teachers seek help for boys than girls. This is because boys are more often too disruptive to those around them, are more noticeable and therefore becoming a treatment priority. There is also evidence that girls with ADHD display more internalising behaviour problems than boys, and therefore less likely to disrupt those around them. Ohan and Visser also suggested that gender gap in ADHD service seeking is also due to teachers and parents perceptions that learning assistance would benefits more boys than girls. Females have been found to be predominantly of inattentive subtype than males, and this lead to higher age of onset and diagnosis of ADHD.[35,47]

Of note is that, out of the 21 males with hyperactivity, 11 (55%) of them had a diagnosis of mental retardation. Gender difference was also established in a study done in Western Cape on children with mental retardation. Boys had more behavioural problems as compared to girls.[42] Christiason and Zwane also found that more male are diagnosed with intellectual disability than female.[24] Another African study was done in Nigeria, involving 44 children with intellectual disability. Researchers found that males were more likely to have conduct and hyperactivity behavioural problems than females.[41]

All female children with hyperactivity had diagnosis of mental retardation. However, this might have been influenced by a small sample size. Guarelli and colleagues found than more females with intellectual disability had behavioural problems as compared to males.[48] Findings from one study concluded that gender does not affect the prevalence of behavioural problems in children with mental retardation. Variations might be due to different profile of study population as well as methodologies used.[41]

Age distribution of psychiatric disorder associated with hyperactivity

Many children with ADHD were of age 3 – 6, and the number decreased with age. No child was diagnosed with ADHD associated with hyperactivity after the age of 10 years in this study. Ramtekkar and colleagues reported that prevalence of ADHD was highest in children (11.7%), followed by adolescent (9.7%), and lowest in adults (6.4%).[49]

Costello and colleagues study on prevalence and development of psychiatric disorder in childhood and adolescence in 9 – 16 years age groups, demonstrated that prevalence of psychiatric disorders were higher in 9 -10 year olds. Prevalence was lowest in 12 year olds because the disorders like ADHD, enuresis and encopresis were almost disappearing.[36] Decrease of disorders with age has been attributed by many studies to hypothesis that ADHD symptoms decrease with brain maturation. The lack of age appropriate criteria for adolescence and adult according to DSM IV also contributed to this decline in diagnosis. Some studies reported that hyperactive / impulse DSM IV ADHD symptoms are most common in children, and inattentive type common in adolescence.[49]

Mental retardation was equally distributed between age 3-6 and 7-10. Intervention at this stage might have been influenced by failure to meet scholastic demands. Very few patients presented for the first time with mental retardation after the age of 10 years. Late presentation might be because many children do not have access to any form of assessment. The other reason is the inability of the education system to identify these children and to know when and where to refer them for help.[34]

5.1. LIMITATIONS

The study considered children referred from clinics, self – referred, and referrals from other health professionals, which can differ from community cases because of their severity of behavioural problems. It is a single centred study as is only for those children who presented at Dr George Mukhari Hospital, which is a tertiary facility. Therefore this children had severe symptoms and don't represent the whole community.

This clinical study resulted in overrepresentation of males as compared to female. Sample size was small. Children with mental retardation were not graded according to severity. This was because of the inconsistency in grading during the initial assessment.

CHAPTER 6

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

This study has shown that hyperactivity is a common behavioural problem in children at Dr George Mukhari outpatient psychiatry unit. Almost half of children who presented in this unit had a problem of hyperactivity. Majority of children who presented with hyperactivity were males as compared to females. Mental retardation with a behavioural problem of hyperactivity was the most common childhood disorder, followed by attention deficit hyperactivity disorder. Medical problems also contributed to some children who presented with hyperactivity. Therefore, hyperactivity is a common problem that should be addressed in communities.

6.2. Recommendations

Childhood mental disorders and their associated behavioural problems are common conditions that need early identification and intervention. It is important for mental health and educational services to consider screening younger children for childhood mental problems, and not wait for severe form of symptoms or complications during adulthood. Communities and schools should be educated about hyperactivity symptoms and its impact on schooling and adult life. Because of a high number of children with mental retardation, there is an urgent need for health department to provide facilities for children with learning difficulties.

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7. APPENDIXES

APPENDIX A: DATA COLLECTION SHEET

A. Socio-Demographic Data

File Number							
Child's Age							
Gender :	M		F				
Schooling :	Preschool/Crèche				Grade		
Grades failed and number of times	Grade failed				Number of times		

Parents' Age :	Mother				Father		
Parents Marital Status	Married		Unmarried		Other		
Parents Occupation	Father						
	Mother						
Who is currently staying with the child							
Both Parents		Father		Mother		Grand Parents		Other (Specify)	

B. Clinical Data

Date of First Presentation to Child Psychiatric Unit					
Reasons of referral					
Duration of Symptoms					
Any history of hyperactivity?	Yes		No		

Signs and symptoms of Hyperactivity found	**Yes**	**No**
Fidgeting		
Leaves seat in classroom or other place where it's expected to remaining seated		
Runs around and climb things excessively		
Talkativeness		
Difficulty playing and engaging in leisure activities quietly		
In ability to sit still		
Impairment in social and academic functioning		

Family history of mental illness	**Yes**		**No**	
If "Yes" Specify				
Family history of childhood psychiatric disorder	**Yes**		**No**	
If "Yes" Specify				
Past medical history	**Yes**		**No**	
If "Yes" name the disease and age of onset	Name of disease			

	Age of onset			
Developmental problems / delayed milestones	**Yes**		**No**	
If “Yes” specify				
History of substance abuse	Yes		No	
If “Yes” specify				

Was the medical problems excluded by pediatrician or family physician?	Yes		No	
Diagnosis: What is the psychiatric condition associated with hyperactivity?				
MEDICATION	Psychiatric drugs		Other drugs	

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PROJECT NUMBER: MREC/M/12/2011: PG

PROJECT :

Title:	Hyperactivity in children with psychiatric disorders at Dr George Mukhari Child Psychiatry Unit
Researcher:	Dr TJ Manyage
Supervisor:	Prof S Rataemane
Co-supervisor:	Dr PS Mazibuko
Hospital Superintendent:	Dr C Holm
Department:	Psychiatry
School:	Medicine
Degree:	MMed Psychiatry

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 10 March 2011

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PROF GA OGUNBANJO
CHAIRPERSON MREC

Note:

i) **Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.**

ii) **The budget for the research will be considered separately from the protocol.**

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