The demographic and clinical profile of HIV infected and non- infected children and adolescents attending two district psychiatric clinics in Sedibeng: a retrospective record review

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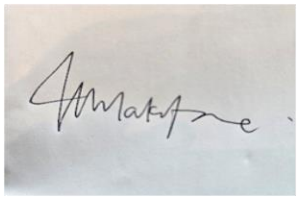
A research report submitted in a submissible format to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Psychiatry

Johannesburg, 2024

DECLARATION

I, Lerato Makofane, declare that this research report is my own work. It is being submitted in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Psychiatry. It has not been submitted before for any degree or examination at this or any other University.



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30th

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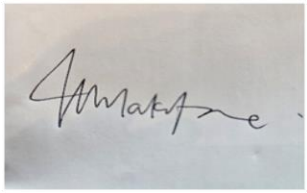
AUTHORS' CONTRIBUTIONS

Declaration: Student's contribution to article(s) and agreement of co-author(s)

I, [Lerato Makofane], student number [1510565], declare that this Thesis/Dissertation/Research Report is my own work and that I contributed adequately towards research findings published in the article(s) stated below which are included in my Thesis/Dissertation/Research Report .



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Date: ……30 April 2024……

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DEDICATION

For I know the plan I have for you," declares the Lord, "plans to prosper you and not to harm you, plans to give you hope and a future." JEREMIAH 29:11

This work is dedicated to all the children we have the privilege of serving at our clinics and from whom we continue to learn so much.

PRESENTATIONS AND PUBLICATIONS

1. Accepted as a poster presentation at the South African Society of Psychiatrists Congress of 2021 held at Drakensburg Champagne Lodge on 24 October 2021.

2. Poster presentation at Wits University School of Medicine research day 16 November 2021.

AUTHOR GUIDELINES FOR THE SOUTH AFRICAN JOURNAL OF PSYCHIATRY

Original Research Article

An original article provides an overview of innovative research in a particular field within or related to the focus and scope of the journal, presented according to a clear and well-structured format. Systematic reviews should follow the same basic structure as other original research articles. The aim and objectives should focus on a clinical question that will be addressed in the review. The methods section should describe in detail the search strategy, criteria used to select or reject articles, attempts made to obtain all important and relevant studies and deal with publication bias (including grey and unpublished literature), how the quality of included studies was appraised, the methodology used to extract and/or analyse data. Results should describe the homogeneity of the different findings, clearly present the overall results and any meta-analysis.

Word limit	3000-4000 words (excluding the structured abstract and references)
Structured abstract	250 words to include a Background, Aim, Setting, Methods, Results and Conclusion
References	60 or less
Tables/Figures	no more than 7 Tables/Figure
Ethical statement	should be included in the manuscript
Compulsory supplementary file	ethical clearance letter/certificate

Original Research Article full structure

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract: The abstract, written in English, should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original Research article should consist of six paragraphs labelled Background, Aim, Setting, Methods, Results and Conclusion.

- Background: Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- Aim: State the overall aim of the study.
- Setting: State the setting for the study.
- Methods: Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- Results: State the main findings.
- Conclusion: State your conclusion and any key implications or recommendations.

Do not cite references and do not use abbreviations excessively in the abstract.

Introduction: The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

- Social value: The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by use of evidence from the literature.
- Scientific value: The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of what is already known about the research question or specific topic, and should clarify the knowledge gap that this study will address. Your argument should be supported by use of evidence from the literature.
- Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.
- Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design: This must address the following:

- Study design: An outline of the type of study design.
- Setting: A description of the setting for the study; for example, the type of community from which the participants came or the nature of the health system and services in which the study is conducted.
- Study population and sampling strategy: Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used. Describe in practical terms how this was implemented.

- Intervention (if appropriate): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.
- Data collection: Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.
- Data analysis: Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used or steps followed in qualitative data analysis.
- Ethical considerations: Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution's name and permit numbers should be stated here.

Results: Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data. All units should conform to the **SI convention** and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion: The discussion section should address the following four elements:

- Key findings: Summarise the key findings without reiterating details of the results.
- Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.
- Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.
- Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion: Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

Acknowledgements: Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution. Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named. Refer to the acknowledgement structure guide on our *Formatting Requirements* page.

Also provide the following, each under their own heading:

- Competing interests: This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect: *The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.* Read our **policy on competing interests**.
- Author contributions: All authors must meet the criteria for authorship as outlined in the **authorship** policy and **author contribution** statement policies.
- Funding: Provide information on funding if relevant
- Data availability: All research articles are encouraged to have a data availability statement.
- Disclaimer: A statement that the views expressed in the submitted article are his or her own and not an official position of the institution or funder.

References: Authors should provide direct references to original research sources whenever possible. References should not be used by authors, editors, or peer reviewers to promote self-interests. Refer to the journal referencing style downloadable on our *Formatting Requirements* page https://sajp.org.za/index.php/sajp/pages/view/submission-guidelines#part_2

ABSTRACT

Background: A limited district-based child and adolescent psychiatric service is provided in Gauteng province. Mental disorders are common in children and adolescents living with HIV and there is a bidirectional relationship between mental health and HIV.

Aim: To ascertain the prevalence of HIV among children and adolescents attending two clinics and to compare clinical correlates of those living with and without HIV.

Setting: Child and adolescent psychiatric clinics based at two community health centres (Zone 12 Clinic in Sebokeng township and Johan Heyns Clinic in a suburban area of Vanderbijl Park) in the Sedibeng district of Gauteng province.

Methods: A retrospective record review was conducted of all active files.

Results: 370 records (232 from Johan Heyns and 138 from Zone 12) were retrieved. Only five (1.4%) users were living with HIV, therefore no comparison could be made between users with and without HIV. All five users living with HIV were male and Black African, with an age range of 9-22 years. Of the five, three had one deceased parent and two had lost both parents. Psychiatric diagnoses were intellectual disability (n=3), epilepsy (n=3), ADHD (n=3), depression (n=1), and traumatic brain injury (n=1).

Conclusion: Very few children and adolescents living with HIV attended either clinic. The sample reflects different help-seeking priorities and access among different communities regarding mental health. More services and research focusing on community child and adolescent mental health services is required.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to everyone who helped me through this arduous journey:

- Firstly, to my supervisor Prof. Robertson without whom this work would never have been possible. Thank you for your guidance and patience.
- To my family and friends for your unfailing support and love throughout
- Finally, to the children we serve and the caregivers who look after them. May your light continue to shine.

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LIST OF ABBREVIATIONS

ADHD: Attention deficit hyperactivity disorder

AIDS: Acquired Immune Deficiency Syndrome

ART/ ARV: Antiretroviral therapy

ASD: Autism spectrum disorder

BDZ: Benzodiazepines

DSM 5: Diagnostic and Statistical manual of mental disorders fifth edition

HIV: Human Immuno-deficiency virus

JH: Johan Heyns clinic

LMIC: Low to middle income countries

LSEN: Learner/s with special educational needs

MDD: Major depressive disorder

MDT: Multidisciplinary team

OCD: Obsessive compulsive disorder

ODD: Oppositional defiant disorder

PHC: Primary health care

PHEU: Perinatally HIV exposed but uninfected

PHIV: Perinatally HIV Infected

PLWHIV: People living with HIV

PTSD: Post traumatic stress disorder

RX_STIM_METHYL: Methylphenidate/ Ritalin

UNAIDS: The Joint United Nations Programme on HIV/AIDS

UNICEF: The United Nations Children's Fund

VCODE: Other conditions that maybe a focus of clinical attention

WHO: World Health Organization

ZONE 12: Sebei Motsoeneng Clinic

SUBMISSIBLE PAPER

HIV prevalence among and clinical profile of children and adolescents attending two community-based psychiatric clinics in Gauteng, South Africa INTRODUCTION

Background

Mental disorders affect at least 10% of children and adolescents worldwide.[1] There is a bidirectional relationship and high comorbidity between HIV and mental illness in children and adolescents.[2] Perinatally HIV infected (PHI) and HIV exposed children and adolescents have higher rates of psychiatric disorders and psychotropic drug use compared to uninfected children, as well as poor adherence to antiretroviral treatment (ART).[1] The mental health care needs of children and adolescents remain neglected, especially in low- and middle-income countries (LMICs). [2] There is limited access to mental health services in LMIC due to systemic, cultural and individual barriers. [2] In order to address these issues, intersectoral collaboration between various government departments is recommended.[3] While there are barriers, there are some limited services in the community setting in Gauteng province of South Africa.[4] This provides an opportunity to examine the prevalence of HIV in children and adolescents who access care at community based psychiatric services.

Literature Review

Mental Illness in Children and Adolescents

Mental illness in children and adolescents is associated with significant disease burden including stigma and isolation, poor academic achievement, suicide, violence, substance use, pregnancy and potentially increased risk of psychopathology later in adulthood.[5] Patel et al. (2008)[5] describe the aetiology of mental illness as multifactorial and including: 1) Biological factors (genetic vulnerability, exposure to toxins, substance abuse and head trauma and 2) Psychosocial factors (adverse childhood events such as abuse, neglect, bereavement, family conflict and bullying). Protective factors include familial ties and social support.[6] The risk of mental illness is further exacerbated in vulnerable environments with poor social support and socioeconomic inequalities, such as those found in South Africa. Kieling et al. (2011)[7] highlight that, whereas 90% of children and adolescents live in LMIC, only 10% of mental health research comes from these countries, thus there is a lack of data from which the true prevalence of mental illness in children and adolescents in LMIC may be estimated.

The global burden of disease study reveals neuropsychiatric disorders to be the leading cause of disability in young people globally[8] and suicide has been noted to be the second leading cause of death among young people worldwide.[9] The most common disorders identified in children and adolescents are neurodevelopmental disorders such as ADHD, Autism Spectrum disorder (ASD), Mood and Anxiety Disorders, Trauma and Stress related disorders as well as Disruptive Behavioural Disorders.[8] Substance Use Disorders and Self harming behaviour including suicide

are a growing concern among adolescents.[5] In comparing youth 15 - 19-year-olds from five international cities Cheng et al (2014)[6] found female adolescents in Johannesburg had the highest levels of reported depression and posttraumatic stress symptoms (44.6% and 67.0%). Additionally, in South Africa, high numbers of children with intellectual disability have been noted, many with comorbidities such as epilepsy and cerebral palsy and HIV.[10]

There are no national epidemiological studies showing the prevalence of mental disorders in children and adolescents. A survey in the Western Cape, by Kleintjies et al (2006)[11] found the prevalence of the most common mental disorders among children and adolescents to be generalized anxiety disorder (11%), followed by posttraumatic stress disorder (8%) and major depressive disorder/ dysthymia (8%). The estimated prevalence of ADHD was 5% and that of conduct and oppositional defiant disorders was 4% and 6%, respectively. Schizophrenia, bipolar disorder and obsessive compulsive disorder had prevalence rates of 0.5%, 1% and 0.5%.

HIV in Children and Adolescents

The United Nations predicts that if current trends persist, there will be 3.5 million adolescent HIV infections by the year 2030 globally[12] the majority of whom will be living in sub-saharan Africa. South Africa has one of the highest childhood HIV burden in the world. According to UNAIDS, in 2019,[12] an estimated 340,000 children (aged 0 to 14, prevalence of 2% in 2017) were living with HIV in South Africa, 55% of whom were on treatment. [13] Due to the success of combination HIV prevention and interventions like the mother-to-child transmission programme and improved ART guidelines, new infections have declined among South African children. However, despite these efforts, postnatally acquired new HIV new infections continue to rise among females aged 15-19 (prevalence 5.8%) and 20- 24 year olds (prevalence 15.6%) compared to males. [13, 14]

Mental Illness and Child and Adolescent HIV

HIV and mental illness commonly co-exist.[15-17] In children and adolescents with HIV, mental illness may be caused directly by the virus or may occur co-morbidly. Biologically, the negative effects of HIV infection in children and adolescents on the neurocognitive and overall growth and development has been well described.[17, 18] Psychosocially, the literature shows that PHI children and adolescents have higher rates of behavioural and emotional problems, including psychiatric illness and long-term psychological effects.[16, 17] This is due to a variety of factors, such as the stress in disclosure of status, stigma and discrimination, poverty, bereavement and grief, being orphaned and parental illness.[2, 18] This finding was further demonstrated by, Cluver et al. (2012) in a four- year prospective study, where AIDs orphans were found to have worse mental health outcomes compared to other orphans in South Africa.[1]

Other findings also highlight the variability in HIV rates among adult psychiatric populations across different settings and patient groups within the country. Collins et

al. 2009 reported higher rates of HIV than the national prevalence at 26.5% in adults admitted to a public psychiatric hospital. [20] Henning et al 2012 found a prevalence similar to the national prevalence of 11% at a psychiatric hospital in recently admitted and long-term psychiatric inpatients. [21] Raman and van Rensburg however, found an HIV prevalence of 2% in a hospital- based child and adolescent clinic in Johannesburg. [22]

In Johannesburg, Woollett et al. (2017)[16] explored the risks for mental health problems in adolescents with HIV accessing HIV treatment in affected adolescents aged 13–19 years. The results of this study echoed many of the findings of other internationally based studies. The study found that 27% of adolescents were symptomatic for either depression, anxiety or PTSD and 24% reported suicidality. Peer violence, hunger, being inappropriately touched, being hit and being female were significantly correlated with all mental health problems. Exposure to violence, feeling unsafe at home or in the community also increased mental health risks. Knowing one's HIV status was protective, as was having aspirations for the future. Effective management of mental illness in children and adolescents with HIV requires a holistic, integrated approach from a multidisciplinary team. This includes mental health screening, early intervention and management, appropriate referral and access to medical and psychosocial support services. [23, 24, 25]

Motivation for the study

Due to the paucity of data there is a need to know more about mental illness among children and adolescents in South Africa, particularly those with HIV, and those in a community setting. We wanted to understand what the clinical picture in our setting was regarding HIV in the context of children and adolescents with mental illness while simultaneously filling in a gap in the literature.

Aim and Objectives

The aim of the study was to ascertain the prevalence of HIV and to describe the sociodemographic and clinical profile of children attending two community based psychiatric clinics in Sedibeng district of Gauteng.

The study objectives were to:

1. Determine the prevalence of HIV among children and adolescents attending two community psychiatric clinics in the Sedibeng district health services.
2. Describe the socio-demographic and clinical profile of all children and adolescents attending the two clinics.
3. Compare those with HIV to those without HIV in terms of sociodemographic and clinical variables.

However, the number of children and adolescents living with HIV was too low to conduct statistically meaningful comparison. In addition, interesting differences were

observed between the two clinics. Therefore, the third objective was changed to comparison between the two clinics in terms of patient population served.

Method

A quantitative study design was used in which a retrospective record review was conducted of children and adolescents attending two community psychiatric clinics in the Sedibeng District of Gauteng.

Study setting

The Sedibeng District comprises of three municipalities: Emfuleni, Lesedi and Midvaal local municipalities in the south of Johannesburg. This area is situated on the banks of the Vaal River and lies on the border of three other provinces, namely Free State, North West and Mpumalanga.[19] It serves a population of approximately 1 million people.[19] Community psychiatric services for both adult and child and adolescent are offered from eight different clinics in township and suburban areas. The study was conducted at two of these clinics in order to obtain an adequate sample size and a demographically representative population group, namely the Sebei Motsoeneng Community Health Centre in Zone 12 of Sebokeng Township ('Zone 12 clinic') and the Johan Heyns Community Health Centre in Van der Bijl Park. Zone 12 clinic serves a predominantly Southern Sotho speaking community from a lower socio- economic background, whereas Johan Heyns clinic serves a predominantly Afrikaans speaking community from a low to middle income background, as well as people from nearby townships and a small Indian population. The clinics were purposefully selected for the study based on their location and the knowledge that they had adequate record keeping and filing systems. Community psychiatric services linked to the Department of Psychiatry of the University of the Witwatersrand are rendered at these clinics. A psychiatric doctor service is provided weekly by visiting psychiatric registrars during their Community Mental Health rotation.

Inclusion and Exclusion Criteria

All clinical records of children and adolescents present in the filing systems (i.e., active records, not yet archived) at the Zone 12 and Johan Heyns clinics who had attended at any point before 28 February 2019, the date on which data collection commenced. The study period was from 1 February 2018 – 28 February 2021.

Data collection

The clinical files were retrieved and handled by the researcher with assistance from psychiatric nursing staff and clerk in the two selected clinics. Data was populated from patient files into a prepared Microsoft Excel worksheet (**2019**). After cleaning

the data, all data were imported into Stata version 15 for descriptive and statistical analysis.

The data collected were as listed below (Please see APPENDIX A below). Stats SA nomenclature was used to describe population group. Where socio-demographic data was missing it was documented as unknown.

For the purposes of this study, it was assumed that all positive information was recorded in the patient files. It was noted however, that not every patient had an HIV test documented in the file. Where an HIV test was present, the type of test ELISA or rapid was also not specified.

Statistical analysis

The Demographic and Socio-economic profiles, clinical conditions, medicines, and whether a participant was seeing a member of the MDT team were described by the facility where care was received. Summaries for categorical variables were obtained using frequencies and proportions. Continuous variables were summarised using means and standard deviation and for non-normal continuous variables medians and the inter-quartile range (IQR) were used. Histograms with a superimposed normal plot were used to decide whether a continuous variable's distribution approximated the normal distribution or not.

The associations between the facility and each of the variables were tested using the chi- square test for categorical variables, the t-test (for approximately normal continuous variables) and the Mann Whitney test (for non-normal continuous variables). Logistic regression was used to investigate the associations between the demographic and socio-economic profiles and the most common diagnoses (have a frequency over a third of our study sample).

Ethical considerations

A study number was assigned to each patient record and all patient identifying markers were removed from the data set so as to ensure anonymity. A link to the identifying data was kept separate and secure by the investigator. Ethics approval was granted by the Human Research Ethics Committee at the University of the Witwatersrand (M180923). Permission to conduct the research at the relevant clinics was also requested from the Sedibeng Health District Research Co-ordinator.

Results

The study sample comprised 370 clinical files, 232 (63%) from Johan Heyns Clinic and 138 (37%) from Zone 12 Clinic (Table 1).

Socio- demographic characteristics

The Demographic characteristics are shown in Table (1) below. Most records were of male patients (n=261; 70.5%), and most were Black African (n=268; 72.4%). The age at the last clinic visit ranged from 2 – 22 years. The mean age at admission was 8.09 years and at the last clinic visit was 11.38 years, suggesting an average duration of clinic attendance of approximately two and a half years (29.8 months). Two users were above the age of 18 years at their last visits (one of 19 years and one of 22 years), both of whom last attended the clinic in February 2019 and both of whom were still in a mainstream school.

There was a significant difference between the two clinics in terms of the grant types ($p<0.001$). Receipt of either a care dependency grant or a foster care grant was more common among those attending Zone 12 compared to those attending Johan Heyns. Likewise, the type of school differed between the two clinics ($p=0.015$), with special education schools being more common among those (NB – care dependency indicates disability, Foster care indicates lack of a parent/ loss/ removal) attending Zone 12 Clinic.

Table 1: Demographic Characteristic of the children and adolescents attending the clinics.

Variables	JOHAN HEYNS (N = 232)	ZONE 12 (N = 138)	Total (N = 370)		pvalue
Duration (months)					0.838
Median (Q1, Q3)	30.2 (12.7, 54.0)	28.9 (9.9, 62.9)	29.8 (11.4, 55.4)		
Age at Admission (years)					0.991
Mean (SD)	8.09 (2.95)	8.09 (3.42)	8.09 (3.13)		
Age at last visit (years)					0.635
			0-14	291	
			15-19	78	
			20-24	1	
Mean (SD)	11.31 (3.27)	11.49 (3.68)	11.38 (3.42)		
Sex					**0.028**
Female	59 (25.4)	50 (36.2)	109 (29.5)		
Male	173 (74.6)	88 (63.8)	261 (70.5)		
Race					**<0.001**
White	101 (43.5)	0 (0.0)	101 (27.3)		
Black African	130 (56.0)	138 (100.0)	268 (72.4)		
Missing data	1 (0.4)	0 (0.0)	1 (0.3)		
Grant Type					**<0.001**
Child Support	59 (25.4)	31 (22.5)	90 (24.3)		
Care Dependency	88 (37.9)	64 (46.4)	152 (41.1)		
Foster Care	12 (5.2)	25 (18.1)	37 (10.0)		
Unknown	73 (31.5)	18 (13.0)	91 (24.6)		
Type of School					**0.021**
Mainstream School	119 (51.3)	46 (33.3)	165 (44.6)		
Special Education	89 (38.4)	73 (52.9)	162 (43.8)		
Stimulation Training Centre	2 (0.9)	2 (1.4)	4 (1.1)		
Pre-School	9 (3.9)	6 (4.3)	15 (4.1)		
Unknown	13 (5.6)	11 (7.9)	24 (6.5)		

Care-giver characteristics

Care-giver characteristics of the children and adolescents attending the clinics are presented in Table (2) below.

The primary care giver for majority of users (over 90%) was a biological parent/ grandparent or relative. The remainder were cared for by a foster parent who was not a relative or by an NGO (Table 3). A deceased parent was noted in 54 (14.6%%) records. There were more deceased parents at Zone 12 (n=32; 23.1%) compared to JH (n=22; 9.4%). A significant difference between the two clinics in terms of caregiver relationship status is that at JH caregivers were more likely to care together as a couple (n=121; 52.2%) while at Zone 12 they were more likely to be single females (n=91; 65.9%). In 85.4% of records, it was not recorded if a parent had demised. Almost all of the users live in a formal dwelling.

*Table 2: Caregiver characteristics of **children and adolescents attending the clinics.***

Variables	JOHAN HEYNS (N = 232) n (62.7%)	ZONE 12 (N = 138) n (37.3%)	Total (N = 370)	p-value
Primary Care Givers				**<0.001**
Biological Parents	202 (87.1)	89 (64.5)	291 (78.6)	
Biological Grandparents	14 (6.0)	21 (15.2)	35 (9.5)	
Relatives	1 (0.4)	10 (7.2)	11 (3.0)	
Foster Parents	9 (3.9)	5 (3.6)	14 (3.8)	
Home or NGO	2 (0.9)	9 (6.5)	11 (3.0)	
Missing data	4 (1.7)	4 (2.9)	8 (2.2)	
Deceased Parents				**0.033**
One Parent	20 (8.6)	21 (15.2)	41 (11.1)	
Two Parents	2 (0.9)	11 (8.0)	13 (3.5)	
Missing data	210 (90.5)	106 (76.8)	316 (85.4)	
Caregiver Relationship Status				**<0.001**
Couple	121 (52.2)	29 (21.0)	150 (40.5)	
Single Female	98 (42.2)	91 (65.9)	189 (51.1)	
Single Male	2 (0.9)	5 (3.6)	7 (1.9)	
Missing data	11 (4.7)	13 (9.4)	24 (6.5)	
Caregiver Employment				0.422
Unemployed	173 (74.6)	108 (78.3)	281 (75.9)	
Employed	59 (25.4)	30 (21.7)	89 (24.1)	
Type of Dwelling				0.387
Formal Dwelling	227 (97.8)	133 (96.4)	360 (97.3)	
Informal Dwelling	1 (0.4)	0 (0.0)	1 (0.3)	

Clinical characteristics

Population with HIV

There was a total of five users with HIV and who were on ART. Three of the users were from Zone 12 and two from JH (Table 3). All the users were Black African males with an age range of between 9 years and 22 years at the time of data collection. All of the users were being cared for by biological parents, grandparents or relatives. All of the users had at least one or both parent(s) deceased. Three attended mainstream school, two attended special education schools. It should be noted that files did not note when a user has a negative HIV status. Therefore, when not documented it was assumed to be negative.

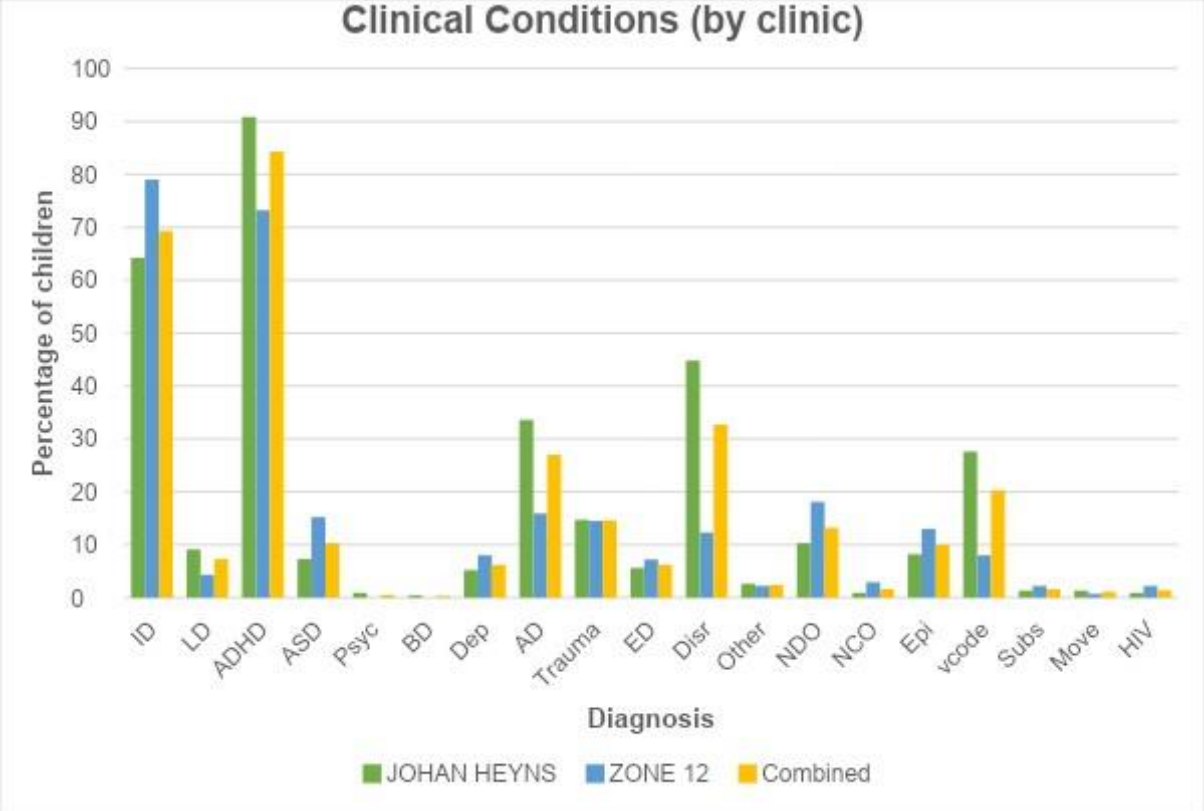
Table 3: Population with HIV: Socio-demographics and Psychiatric diagnoses

	Case 1	Case 2	Case 3	Case 4	Case 5
Age	16	13	9	22	9
Gender	Male	Male	Male	Male	Male
Race	Black	Black	Black	Black	Black
Primary caregiver and income	Biol GM, pensioner	Single mother, domestic worker	Biol GP, unknown	Relatives, unknown	Relatives, unknown
Deceased parents	One	One	One	Both	Both
Type of schooling	Mainstream	LSEN	LSEN	Mainstream	Mainstream
Diagnosis-psychiatric and medical	Depression	Severe ID/ ADHD Head Injury/ Epilepsy	Severe ID/ ADHD/ Epilepsy	Substance use disorder/ Epilepsy	Unspecified ID/ ADHD/ RAD/ Conduct disorder
Receiving ART	Yes	Yes	Yes	Yes	Yes
Other Rx	Antidepressant	Methylphenidate Mood stabilizer/ AED	Methylphenidate Mood stabilizer/ AED	Mood stabilizer/ AED Antipsychotic Antidepressant	Methylphenidate Antipsychotic antidepressant
Grant type	Foster	Child support	Care dependency	Unknown	Foster
Clinic attended	Zone 12	Zone 12	Johan Heyns	Johan Heyns	Zone 12

Psychiatric diagnoses

Figure (1) illustrates the frequency of psychiatric diagnoses in the total sample and Table (4) shows the differences in diagnoses between the two clinics.

Overall, the most common diagnoses were ADHD (n= 312; 84.3%), intellectual disability (n=258; 69.3%), anxiety disorders (n= 100; 27%) and disruptive and conduct disorders (n=121; 32.7%). Comparatively, Johan Heyns had a larger proportion of users diagnosed with ADHD (n=211; 90.9%) whereas Zone 12 had more users diagnosed with intellectual disability (n=109; 79.0%).



Key: ID: intellectual disability; LD learning disability; ADHD: attention deficit hyperactivity disorder; ASD: autism spectrum disorder; Psych: psychotic disorder; BD: bipolar disorder; Dep: depressive disorders; AD: anxiety disorders; Trauma: trauma and stressor related disorder; ED: elimination disorder; Disr: disruptive, impulse-control and conduct disorder; Other: other mental illness; NDO: neurodevelopmental disorder; NCO: neurocognitive disorder; Epi: epilepsy; Vcode: other conditions of focus requiring clinical attention

Subs: substance use disorder; Move: medication induced movement disorders and other adverse effects; HIV: human immunodeficiency syndrome

Figure 1: ***Frequency of psychiatric diagnoses by clinic***

Table 4: ***Psychiatric diagnoses in children and adolescents attending the clinics.***

Variables	JOHAN HEYNS (N= 232)	ZONE 12 (N = 138)	TOTAL (N=138)	P value
Intellectual Disability	149 (64.2)	109 (79.0)	258 (69.3)	**0.003**
Learning Disability	21 (9.1)	6 (4.3)	27 (7.3)	0.093
Attention deficit hyperactivity disorder (ADHD)	211 (90.9)	101 (73.2)	312 (84.3)	**<0.001**
Autism Spectrum Disorder (ASD)	17 (7.3)	21 (15.2)	38 (10.3)	**0.016**
Psychotic Disorder	2 (0.9)	0 (0.0)	2 (0.5)	0.274
Bipolar Disorders	1 (0.4)	0 (0.0)	1 (0.3)	0.440
Depressive Disorders	12 (5.2)	11 (8.0)	23 (6.2)	0.281
Anxiety Disorder	78 (33.6)	22 (15.9)	100 (27.0)	**<0.001**
Trauma and Related Disorders	34 (14.7)	20 (14.5)	54 (14.6)	0.966
Elimination Disorders	13 (5.6)	10 (7.2)	23 (6.2)	0.527
Disruptive and Conduct Disorders	101 (44.8)	17 (12.3)	121 (32.7)	**<0.001**
Other Diagnosis	6 (2.6)	3 (2.2)	9 (2.4)	0.803
Other Neurodevelopmental Disorders	24 (10.3)	25 (18.1)	49 (13.2)	**0.033**
Other Neurocognitive Disorders	2 (0.9)	4 (2.9)	6 (1.6)	0.134
Other Medical Conditions mainly Epilepsy	20 (8.6)	18 (13.0)	38 (10.3)	0.175
Other stresssors (vcode)	64 (27.6)	11 (8.0)	75 (20.3)	**<0.001**
Substance use Disorders	3 (1.3)	3 (2.2)	6 (1.6)	0.517
Movement Disiorders	3 (1.3)	1 (0.7)	4 (1.1)	0.609
HIV status				
Positive	2 (0.9)	3 (2.2)	5 (1.4)	0.291
(Assumed) Negative	230 (99.1)	135 (97.8)	365 (98.6)	

Pharmacotherapy

The most commonly prescribed medicines were Methylphenidate (JH: n= 201; Z12: n= 97; p<0.001), antipsychotics (JH: n= 142; Z12: n= 76; p=0.246), antidepressants (JH: n= 129; Z12: n= 46; p<0.001) and mood stabilisers (JH: n= 51; Z12: n= 22; p=0.158). Almost consistently except in the case of ART; Johan Heyns had a higher proportion of children who were being administered any given drug category.

Multidisciplinary Team

The proportion of users seen by a multidisciplinary (MDT) team member is very low for both clinics. The dietician had the least number of users referred. Only very few users (n=24 ;6.5%) were attending occupational therapy and psychology (n=15; 4.1%) at the clinics overall.

Discussion

Key Findings

In this retrospective record review of 370 clinical files at two district-based child and adolescent psychiatric clinics, only five (1.4%) were of users living with HIV. The low prevalence meant that comparison of demographic and clinical factors could not be made between users with and without HIV. The study however, showed interesting findings and differences between the clinics, possibly related to differences in the communities served by each clinic.

Users living with HIV

We hypothesized that children and adolescent living with HIV would have higher mental health needs and more severe mental health challenges than the general population. [11] We expected to see higher rates of HIV especially among adolescents as AIDS-related deaths among this group are increasing globally[12, 13, 26] and because mental disorders occur more commonly in this population compared to their counterpart without HIV.[27] In our study we found that the prevalence of HIV was considerably lower compared to national prevalence figures. In females across all age groups, the HIV prevalence at our clinics was 0%. This finding is different compared to previous studies which have demonstrated that female adolescents ages 15 to 24 years are a particularly high- risk group for developing non- perinatal acquired HIV infection. [13] In males the prevalence of HIV at our clinics in 0-14 year olds was 1.4% (National prevalence M= 2.4% and F =3.0%) and in 15- 19 year olds was 1.9% (National prevalence M= 4.7% and F= 5.8%). [13] There was an outlier in the age category 20- 24 years (National prevalence M= 4.8% and F 15.6%), [13] a user who was 22 years old and HIV positive.

In addition to physiological and psychosocial transitions adolescents living with HIV face many extra challenges such as concerns about medication regimens, doctors' appointments, life expectancy, social upheaval, disclosure, stigmatization and transmission of virus to others, all of which may lead to greater need of mental health care services in this vulnerable population.[12, 26] As a result of this, studies also reveal a high prevalence of depression, anxiety, post-traumatic stress disorder (PTSD), and behavioral issues among children and adolescents living with HIV. [12, 28, 29] In our HIV population (Table 3) the most common conditions were ADHD, Intellectual disability and Epilepsy. There was only one user with depression and one with trauma and related disorder.

On one hand the low number of users living with HIV in our study perhaps speaks to the success of the national PMTCT programmes. [13] On the other hand, such few numbers could also be interpreted as lack of access and help- seeking on the behalf of users with HIV and so reasons for this should be explored.

One reason could be that our data was based on the available clinical notes. Since we were unable to differentiate accurately between HIV exposed, HIV negative and unknown HIV status, when not documented, HIV status was assumed to be negative. Perhaps it would have been more useful to look at HIV exposure rather than infectivity as this would have yielded a bigger comparison group.

The majority of users (n=279) were in receipt of some kind of grant. The suggestion is that those accessing care have some kind of support system. This is a protective factor against mental illness especially in users living with HIV.[28] Previous studies have found that users with HIV are more likely to be in child-headed households.[14, 29] A possible explanation for the low prevalence in our population is that users are not accessing care due to lack of family support and inability to recognize mental illness. [29] They could also be screened and treated for mental illness in the primary health care and paediatric clinics according to recommended national guidelines on integrated healthcare .[13, 23, 25]

Differences between clinics

Children attending Johan Heyns were more likely to be diagnosed with ADHD, anxiety and conduct disorder whereas those from Zone 12 were more likely to have ID and autism. Methylphenidate was the most commonly prescribed medication and overall there were very few users being seen by MDT members.

Socio-demographic Characteristics

Most users were being cared for by a biological parent or grandparent, lived in formal dwellings and received a grant. In 85.4% of all records, it was not recorded in the clinical file if a parent had demised, an important omission especially when considering the immediate and long-term psychological outcomes on all children and adolescents, but especially in users who are orphaned by HIV and remain negative. [15, 29]

There was no difference between the suburban and the township clinic in duration of attendance and mean age on admission or last visit, and no difference in sex. Compared to Zone 12 Clinic, those attending Johan Heyns Clinic were more often male, White, living with their parents, and attending a mainstream school. The difference in population group may speak to the legacy of the Apartheid era of structural and economic inequalities [30] which favoured racially segregated residential areas. However, it was interesting to note that there was no difference in unemployment rate among caregivers between the two clinics. This may imply that

more unemployed people are accessing the public facility and may not necessarily reflect racial disparities in the population.

Child grants and Schooling

The South African Social Security Agency (SASSA) [31, 32] makes the following grants available to all eligible children under the age of 18 years (amount in Rands per month as of April 2021). The child support grant (R460/month) is available to all children under the age of 18 who are in need provided caregivers meet requirements for a means test. A foster care grant (R1050/month) is applied for to support children who are court ordered to be in foster care. This grant is not means tested. A care dependency grant (R1890/month) is provided for those children with severe mental and physical disabilities requiring permanent care and is also means test dependant.

Studies have shown that receipt of the child grant improves child nutrition, health and schooling outcomes and impacts lifelong productivity and earnings. Additionally, child grants strengthen household resilience to potential financial stressors and in adolescents, offer protection from engagement in risky behaviours (such as substance use and risky sexual behaviour in girls).[32]

In our study we found that Zone 12 users were more likely to receive a care dependency or foster care grant compared to users from Johan Heyns. Thus, the care dependency grants suggest more severe disability in users attending Zone 12. Foster care grant indicates a higher likelihood of a lack or a loss of a parent or removal of a child from a parent in Zone 12 compared to users attending Johan Heyns. More severe disability was also evidenced by the fact that more users proportionally at Zone 12 (n=73; 52.9%) attended LSEN schools (special primary and high schools equipped to deliver a specialised education programme to learners requiring access to highly intensive educational support).[33] Of concern however was the lack of mainstream school goers attending our clinics (45%). We questioned where these children were accessing their mental health needs.

Clinical Diagnoses

Psychiatric diagnoses

In South Africa there is a lack of reliable data pertaining to the prevalence of intellectual disorders in children. What is known is that the majority (up to 2/3rds) of causes of intellectual disability are unexplained[10] and the remaining causes are due to potentially reversible factors occurring prenatally, during birth, in infancy or early childhood such as poor nutrition, vitamin deficiencies, trauma and exposure to infections, alcohol and other toxins. Our study showed that there were more users with a diagnosis of intellectual disability at Zone 12 (n=109; 79%) compared to JH (n=149; 64%). This may further highlight the differences in socio-economic environments in both township and suburban areas. Poverty has been shown to be a major driving factor in the development of intellectual disability as it brings with it the added burden of social exclusion, exposure to crime and violence.[34] At JH the proximity to health care facility of LSEN school may influence lower ID rates.

The prevalence of ADHD in Africa is estimated to be 7.74%.[35] A previous South African study by Meyer et al. (2004)[36] found that the prevalence of ADHD among primary school children across all ethnic populations in Limpopo province was 5.5%. While the prevalence of ADHD among the users at our clinics appears high (91% at JH and 73% at Zone 12) it is not known if this is adequate for the population, although there may be increased awareness, education and screening in our schooling and health systems. However, historically, in the United States black, indigenous and children of colour with ADHD have been underdiagnosed and undertreated.[37] Cultural beliefs, attitudes and perceptions, parental and teacher knowledge may also explain the differences between rates of ADHD between the two clinics and in turn influence help-seeking and treatment.

Disruptive and conduct disorders (n= 121; 32.7%) occurred most commonly after ADHD and ID. This was expected as these conditions tend to occur comorbidly with ADHD. Users were more likely to be reported as having disruptive and conduct disorder at JH (n= 104; 44.8%) compared to Zone 12 (n=17; 12.3%). Therefore, JH users seem to have a lower threshold to presentation in terms of behavioural problems compared to Zone 12 users.

This suggests that there may be other factors at play influencing health seeking behaviour and access to care in different communities which need to be explored. Babatunde et al 2021 identify multiple barriers and facilitators to health seeking behaviours in children and adolescent mental health. These include:

- individual factors (family support, knowledge and cultural beliefs regarding mental health, perceived stigma)
- facility related factors: relationships with health professionals, confidentiality.
- structural related factors: access to care, logistics and financial cost, policy and service delivery. [3]

In our setting, we did not expect structural or facility related factors to be an issue and so it would be interesting to know which factors are involved in the population we serve.

We also expected much higher rates of depression, anxiety, PTSD and other trauma related disorders among our users, however this was not so. In the end we wondered whether these users were possibly being treated in the primary health care centres (PHC). There is a possibility however that these children are not being recognized and are not being treated at all. [22, 23, 25]

Treatment interventions

The most widely used medicine in the clinics was methylphenidate (n=293; 80.5%) which is clinically indicated in view of the high rates of ADHD at both clinics. Fifty-nine percent of users were on antipsychotics (in majority of cases for behavioural containment) and 47% were prescribed an antidepressant. The latter again raises concerns about rates of depression and anxiety that remain unaccounted for at our clinics. [11,17] It is possible that these conditions are not being documented by clinicians.

Another unexpected finding was the low number of users being seen by an MDT member across clinics. This reflects the lack of professionals in the district health care setting. Finally, in view of high ID diagnosis and LSEN attendance, it is also possible that MDT services are accessed at these schools rather than at the clinics.[23]

Limitations

Since this was a retrospective file review it was dependant on adequacy of filing system and accuracy of clinical notes. There was a lack of uniformity between clinicians as diagnoses reflected working assessments and not diagnostic interviews. It was difficult to differentiate between primary and secondary psychiatric diagnoses especially among those who had multiple comorbidities. Severity, other specifiers and v-codes or stressors (eg. parent-child relationship conflict, academic difficulties, neglect etc.), were also not routinely included by clinicians and may have had significant impact on user presentation In addition, the study shows documented HIV and not true HIV prevalence as not every patient had a formal documented HIV test in the file. It is possible that there may have been users whose HIV diagnoses have not yet been disclosed or those who remain unaware of their status and have not yet tested. Expansion of the study to other clinics may have yielded a larger sample of users living with HIV and perhaps yielded different findings.

Recommendation and Conclusion

Notwithstanding the limitations, this study suggests that children with HIV may not be accessing mental health care. There is also a possibility that help seeking for behavioural conditions may be low in township areas.

Child and adolescent mental health services remain underprioritized in South Africa. Key barriers and facilitators to care should be identified to improve future policy. There is a need for more robust and current clinical record keeping. Our study highlights a low rate of HIV among users attending our clinics and made us question if children with disruptive and behavioural problems in the township are receiving care. More community or population-based research is required and it may be beneficial to conduct a similar study in the setting of a child and adolescent HIV clinic for comparison. The prevalence of mental health disorders and HIV may very well differ quiet significantly in these settings.

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Appendices

Appendix A: Approved Research Protocol

The demographic and clinical profile of HIV infected and non-infected children and adolescents attending two psychiatric clinics in Sedibeng: a retrospective record review

Background

Mental disorders affect 10–20% of children and adolescents worldwide (WHO 2005; Flisher et al 2012, Myer et al 2009) and are associated with a lower educational achievement and ultimately lower socio-economic achievement. Furthermore, there is high comorbidity between HIV and mental illness in children and adolescents. Perinatally HIV infected (PHI) and HIV exposed but uninfected (PHEU) children and adolescents have higher rates of psychiatric disorders and psychotropic drug use compared to uninfected children, as well as poor adherence to antiretroviral treatment (ART) (Myer et al 2009). Despite their relevance as a leading cause of health-related disability, the mental health care needs of children and adolescents remain neglected, especially in low- and middle-income countries (LMICs).

Mental Illness in Children and Adolescents

Mental health problems are broadly defined to include psychiatric disorders, general psychological distress, and behavioural problems (Mellins and Malee 2013). The aetiology of mental illness in children and adolescents is multifactorial. Biological factors include genetic vulnerability, in utero exposure to toxins, substance abuse and

head trauma. Psychosocial factors include abuse, neglect, bereavement, family conflict, bullying and other stressful life events (Patel et al 2007). Protective factors include familial ties and social support (Cheng et al 2014).

The risk of mental illness is further exacerbated in vulnerable environments with poor social support and socioeconomic inequalities, such as those found in South Africa (Cheng et al 2014). Mental illness in adolescents is associated with significant disease burden including stigma and isolation, poor academic achievement, suicide, violence, substance use, pregnancy and potentially increased risk of psychopathology later in adulthood (Patel et al 2007).

International Literature

Whereas 90% of children and adolescents live in LMIC, only 10% of mental health research come from these countries (Kieling et al., 2011), thus there is a lack of data from which the true prevalence of mental illness in children and adolescents in LMIC may be estimated. Nevertheless, in their systematic review of the prevalence of child mental health in Sub-Saharan Africa, Cortina et al (2012) found rates of 12% - 29%, which is comparable with those found in high income countries. The rates of mental illness in rural and urban community settings were comparable in some studies, however others showed a higher psychiatric morbidity in urban areas due to exposure to violence and poverty (Kieling et al 2011). One study in Bangladesh compared the prevalence of mental illness in 5- 10 year olds living in rural, urban, and slum areas and found significantly higher rates in the slum area (Mullick and Goodman 2005).

The most common psychiatric disorders identified in children and adolescents are neurodevelopmental disorders such as ADHD, Autism Spectrum disorder (ASD),

Mood and Anxiety Disorders, Trauma and Stress related disorders as well as Disruptive Behavioural Disorders. Substance Use Disorders and Self-harming behaviour including suicide are a growing concern among adolescents (Mellins and Malee 2018, Patel et al., 2007). Neuropsychiatric disorders were found to be the leading cause of disability in young people globally (WHO 2013, Gore et al 2011) and suicide remained the second leading cause of death among young people worldwide (Hawton et al 2012).

South African Literature

There are no national epidemiological studies showing the prevalence of mental disorders in children and adolescents. In the Western Cape, a consensus study by Kleintjies et al (2006) found the prevalence of the most common mental disorders among children and adolescents to be generalized anxiety disorder (11%), followed by posttraumatic stress disorder (8%) and major depressive disorder/ dysthymia (8%). Attention deficit hyperactivity disorder had an estimated prevalence of 5% and other externalizing behavioural disorders such as conduct and oppositional defiant disorders 4% and 6% respectively. Schizophrenia, Bipolar disorder and Obsessive Compulsive disorder were 0.5%, 1% and 0.5%. These rates in fact appeared to be higher than those reported in other LMIC (Kleintjies et al 2006, Flisher et al 2012). A study among 15 - 19-year-old youth in five international cities by Cheng et al (2014), also found the highest levels of reported depression and post-traumatic stress symptoms (44.6% and 67.0%, respectively) to be among female adolescents from Johannesburg. As well as a high presence of other risk factors, there is increased vulnerability to mental illness in South African children and adolescents because of co-morbid HIV infection, substance use and exposure to violence (Kleintjies et al 2006, Flischer et al 2012).

HIV in Children and Adolescents

Most children with HIV are infected perinatally (PHI), through vertical transmission: from mother to child either intrauterine, intrapartum or postnatally through breastfeeding. Children of HIV positive mothers can also be HIV positive or Perinatally Exposed but Uninfected (PHEU). Infection may also occur postnatally and during childhood as with adults, through sexual contact or contamination with unsafe needle practices and unscreened blood. If left untreated, PHI runs a more rapid course and is associated with a higher mortality rate than postnatally acquired HIV (Coovadia and Wittenberg 2004).

International Literature

HIV remains a global epidemic. In 2016, UNICEF reported that 120,000 children under the age of 14 died of AIDS related causes, and 18 children were infected with HIV every single hour globally. It is predicted that if current trends persist, there will be 3.5 million new adolescent HIV infections by the year 2030 (UNAIDS 2017).

Children and adolescents make up a significant proportion of the population in LMICs, many of whom are HIV positive (Woollet et al 2017). It is estimated that approximately
2.1 million adolescents in LMICs were living with HIV in 2012. Of the estimated 3.2 million HIV-positive children under the age of 15 years globally, 90% were said to be living in sub-Saharan Africa (UNAIDS, 2017, WHO, 2013).

With the initiation of antiretroviral therapy (ART), HIV in children and adolescents has evolved into a chronic disease (Gadow et al 2010). However, PHI adolescents remain

a unique patient sub-population who are at risk of having treatment failure and drug resistance (Chernoff et al 2009, Kacanek et al 2015), and adolescents have been shown to be the only age group in which AIDS related deaths are not decreasing (Simbayi et al 2014).

South African Literature

South Africa has one of the highest childhood HIV burden in the world. According to UNAIDS, in 2016, an estimated 320,000 children (aged 0 to 14) were living with HIV in South Africa, 55% of whom were on treatment. Due to the success of the Prevention of mother-to-child transmission programme, new infections have declined among South African children. Regarding postnatally acquired HIV, this is more common amongst 15-19 year olds, and, in South Africa, infections in this age group account for nearly one sixth of all HIV infections (UNICEF 2017, Simbayi et al 2014, Woollett et al 2017). Girls are especially vulnerable. Poverty, poor social status of women and gender-based violence have all been cited as reasons for the disparity in HIV prevalence between genders. Orphaned and vulnerable children and youth have been recognized as a high risk population for HIV infection as well as poor psychological and mental health outcomes (Cluver et al 2011).

Mental Illness and Child and Adolescent HIV

The clinical manifestations of HIV infection are wide-ranging, and the course of the disease is variable. HIV infection causes progressive multisystem immunodeficiency (Coovadia and Wittenberg 2004). However, the impact of the disease extends beyond

the HIV infection to the social and psychological domains, and a bio-psychosocial approach to management is recommended.

In children and adolescents with HIV, mental illness may be caused directly by the virus or may occur co-morbidly (Woolett et al 2017, Gadow et al 2012). Biologically, the negative effects of HIV infection in children and adolescents on the neurocognitive and overall growth and development has been well described. HIV infection can result in several neuropsychiatric syndromes, including cognitive impairment, developmental delay, attention and concentration problems and serious mental illness including depression, anxiety and substance use (Flischer et al 2012; Nassen et al 2014). Furthermore, these children are more prone to develop opportunistic infections and other physical illnesses (Mellins and Malee 2013, Coovadia and Wittenberg 2004) and thus are more likely to have recurrent hospitalizations.

Psychosocially, the literature shows that PHI and PEU children and adolescents have higher rates of behavioural and emotional problems, including psychiatric illness and long term psychological effects (Gadow et al 2012, Woolet el al 2017). This is due to a variety of factors, such as the stress in disclosure of status, stigma and discrimination, poverty, bereavement and grief, being orphaned and parental illness (Myer et al 2009, Nassen et al 2014). The literature also highlights that studies in HIC, measuring the association between HIV and mental health outcomes in children and adolescents were not always comparable with our black African populations, where multiple additional risks and vulnerabilities exist.

International Literature

A systematic review by Mellins and Malee (2013) examined psychiatric disorders in the context of child and adolescent HIV. Overall, the majority of the big studies were based in the United States. These studies suggest that PHI and PHEU children and adolescents experienced emotional and behavioural problems, including psychiatric disorders, at higher than expected rates, often exceeding those of the general population and other high-risk groups. Yet, the specific role of HIV remained unclear, as PHEU individuals displayed similar prevalence rates in some studies, higher rates in others and lower rates still in others when compared to PHI individuals. The most prevalent disorders in HIV positive adolescents compared to HIV negative adolescents were anxiety (46%) and behavioural (25%) disorders. Mood disorders were less prevalent (7%). The rates of most individual disorders were similar in both groups, although ADHD was more prevalent among HIV positive youth (18%) than HIV exposed (8%) youth. Although studies were limited with mixed findings, the review indicated that poor child-health status, poor cognitive function, poor parental health and parental mental health, stressful life events and other chronic medical disorders were associated with worse mental health outcomes. Parent- child involvement, communication, and social support were associated with better function.

Similar results were found in other studies conducted in LMIC. In Rwanda (Betancourt et al, 2014) found that PHEU and PHI children demonstrated higher levels of depression, anxiety, conduct problems, and functional impairment compared with children who were not infected or exposed. In Kenya, a study was to determine the prevalence and pattern of psychiatric morbidity in HIV-infected children and adolescents between 6 and 18 years of age and the relationship between their sociodemographic factors, immune suppression and psychiatric morbidity was

conducted. Kamao et al (2011) found that 34% of children and adolescents attending a paediatric HIV clinic had been orphaned due to HIV/AIDS and only 27.8% of participants had both parents alive. Nearly 50% were two or more classes lower than the ageappropriate grade and nearly 50% of the children and adolescents in the study had at least one type of psychiatric disorder. Anxiety disorders (32.2%), major depression (17.8%), ODD (12.2%) and ADHD (12.2%) were the most prevalent disorders. The study also found that major depression was associated with immune suppression.

South African Literature

In Johannesburg, Woollett et al 2017 explored the risks for mental health problems in HIV positive adolescents accessing HIV treatment. HIV-positive adolescents aged 13-19 years accessing five paediatric antiretroviral clinics in Johannesburg were assessed using standardized measures for depression, anxiety, post-traumatic stress disorder (PTSD), and suicidality.

The results echoed many of the findings of other internationally based studies. The study found that 27% of adolescents were symptomatic for either depression, anxiety or PTSD and 24% reported suicidality. Peer violence was significantly correlated with all mental health problems, as was hunger, being inappropriately touched, being hit, and being female. Those reporting illness in the past year were more symptomatic and there was high exposure to violence overall. Additionally, not feeling safe at home or in the community increased risk for all mental health disorders. Knowing one's HIV status was protective, as was having aspirations for the future. Although this study did not have a comparison group of HIV negative adolescents, it was one of the few

contextually relevant studies found. A study by Zeegers et al 2010 found a high prevalence of ADHD and ODD amongst PHI children. No association was found between the severity of HIV disease and the presence of a behavioural disorder.

HYPOTHESIS

The hypothesis for the study is that children living with HIV will have higher rates of psychiatric illnesses compared to children without HIV.

MOTIVATION

Overall, there is a paucity of literature on comorbid mental health and HIV in children and adolescents in Africa, despite their high prevalence. There is therefore, a need to know more about mental illness among children and adolescents in Gauteng, particularly those with HIV, and those in a community setting. The limited data that is available has largely been conducted at specialized inpatient units at tertiary and quarternary levels (Breuer et al 2011). Currently we do not have data regarding the demographic and clinical profiles of children and adolescents attending specialised psychiatric clinics in the community setting in particular. To our knowledge, there are no other studies under way looking at children and adolescents attending psychiatric clinics at the community level.

We are also motivated to establish a data base of information relating to the prevalence, type and severity of mental illnesses found in our child psychiatric clinics at the community level in Gauteng. Furthermore, we would like to evaluate the extent of HIV comorbidity in this population by comparing the findings of two different clinics.

AIM

The aim of the study is to address the paucity of information by investigating the sociodemographic and clinical profile of children attending 2 psychiatric clinics in Sedibeng. The following research questions will be addressed:

3 What is the profile of children and adolescents attending community psychiatric clinics in a township and an urban area of South Africa?

4 What is the prevalence of HIV among children and adolescents attending community psychiatric clinics in the township and in an urban area?

5 How do children and adolescents living with and without HIV attending the same clinic, compare in terms of socio-demographic profile, medical comorbidity, psychiatric diagnosis, and treatment?

STUDY OBJECTIVES

1. To describe the demographic and clinical profile of all children and adolescents attending community psychiatric clinics in Southern Gauteng.
2. To compare children and adolescents living with and without HIV in terms of the demographic and clinical profile.

METHODOLOGY

Study Design

This study will be a retrospective record review of all the children and adolescents attending 2 specialist community psychiatric clinics in the Sedibeng District of Gauteng.

Study Site

The Sedibeng District Municipality comprises of three Category B municipalities, namely, Emfuleni, Lesedi and Midvaal Local Municipalities.

In order to obtain an adequate sample size and a demographically representative population group, the study will be conducted at two different clinics in Sedibeng: Sebokeng township and Van der Bijl Park. The Sebei Motsoeneng Community Health Centre in Zone 12 of Sebokeng serves a predominantly South Sotho speaking community from a lower socio- economic background, whereas the Johan Heyns Community Health Centre in Van der bijl Park serves a predominantly Afrikaans speaking community from a low to middle income background, as well as people from nearby townships and a small Indian population. There are approximately 150 and 200 children and adolescents attending the Sebei Motsoeneng and Johan Heyns psychiatric services respectively. Specialist psychiatric services are rendered at these clinics together with the Department of Psychiatry of the University of the Witwatersrand. A psychiatric doctor service is provided weekly by visiting psychiatric registrars during their Community Mental Health rotation.

Study Population

Inclusion Criteria

All clinical records of children and adolescents currently attending the Sebei Motsoeneng and Johan Heyns psychiatric community child and adolescent clinics.

Exclusion Criteria

Clinical records of the following patients will be excluded:

1. Patients over the age of 18 years

Data collection

The clinical files will be retrieved and handled by the researcher with assistance from the nursing staff in the allocated clinics for confidentiality. The files will be used after clinic is complete thus ensuring that there is no interference with service delivery and then immediately returned on the same day after use. Approximately 20 files per day will be used per clinic to collect data once all clinic patients have been seen.

The information collected will be as follows: (Please see APPENDIX A below)

Socio-demographic Data

- Age at date of data collection
- Gender: male or female
- Population group: Black African, Coloured, White, Indian, other
- Grant: yes, no, unknown
- Type of grant: child support, foster care, care dependency, other, unknown
- Current level of education
- Type of school: mainstream, LSEN, training centre, other, not at school

- Parents: in a relationship, single mother, single father, both absent, one deceased, both deceased, unknown
- Primary care-givers: biological parents, grandparents, relative, other, orphaned, unknown
- Parental/ care giver employment: yes or no (and other financial source if unemployed), unknown
- Dwelling: formal house, informal, children's home, non-governmental residential facility, other, unknown

Clinical Data

- Primary psychiatric diagnosis
- Comorbid psychiatric diagnosis (es)
- HIV status: positive, exposed, negative, unknown
- ARV treatment: yes, no, unknown
- Other medical conditions
- Current treatment
- Current MDT management

Data Analysis

All statistical analyses will be conducted using R software (R version 3.4.2; https://www.r-project.org). All tests will be two-tailed probability values, and statistical significance accepted when $\alpha \leq 0.05$. The data set for this study will be generated mainly from assessments of categorical scores. Categorical data are usually nonnormal, so appropriate non-parametric analyses will be used.

Statistical analyses used in each of the two objectives are outlined below.

Objective 1. For the demographic and clinical profile of children and adolescents attending the community psychiatric clinics, descriptive statistics (frequency; percentage) will be reported for the different variables (e.g. Age, Sex) per clinic. The contributions of the components to each variable by clinic will then be analysed separately using Chi-squared good of fitness tests

Objective 2. To compare the demographic and clinical profiles of patients with different HIV histories/status (i.e. those infected with HIV, those who were exposed but not infected, those not exposed and non-infected) in the two clinics (Zone 12 and Vanderbijlpark), a general linear model (GLM) will be used in which HIV history/status and clinic are fixed predictors and the different components of the demographic and clinical profiles as dependent variables. The distribution (e.g. poisson, binomial) and link functions will be appropriately selected for the different variables..

Sample size

From an assessment of Z scores of expected frequencies, a sample size of 300 (~150 per clinic) will detect statistical significance at the 5% level for the general linear model (GLM) analyses in objective 2. Realistically, statistical significance can be expected with a minimum sample of 210 patients in total for both clinics.

ETHICS

Prior to commencement of the study, an application for Ethics approval will be made to the Human Research Ethics Committee at the University of the Witwatersrand. Permission to conduct the research at the relevant clinics will be requested from the Sedibeng Health District Research Co-ordinator. A study number will be assigned to each patient record and all patient identifying markers will be removed from the data set so as to ensure anonymity. A link to the identifying data will be kept separate and secure by the investigator. We expect to have completed a first draft of the study write up by February 2019.

LIMITATIONS OF THE STUDY

Due to the nature of the retrospective review, the following limitations have been identified:

1. The limited time in which the study will be conducted.
2. Incomplete patient records may affect data collection and sample size.
3. Inconsistent record keeping due to different clinicians assessing the patients.
4. Study results may not be may representative of other communities or applicable to different hospital settings.

FUNDING

The cost of the study will be incurred by the researcher.

ITEMS	COST
1. Transport/Fuel	R 2500

2. Stationary	R 500
Total	R3000

TIMELINE

	Jan-Apr 2018	Marc 2018	April-July 2018	Aug 2018	Sept 2018	Oct 2018	Nov 2018	Dec 2018	Jan-Mar 2019
Research Protocol Development									
Assessment and Ethics Application									
Data Collection									
Data Analysis									
Write-up									

APPENDIX A: DATA CAPTURING SHEET

CLINIC	
SUBJECT NUMBER	
HOSPITAL NUMBER	

SOCIO- DEMOGRAPHIC DATA

1. Age at date of data collection in years:_____
2. Gender:

Male	Female
1	2

3. Population group:

Black	White	Coloured	Indian	Other
1	2	3	4	5

4. Grant:

Yes	No	Unknown
1	2	3

Type of Grant:

Child Suppport Grant	Foster Care Grant	Care Dependancy Grant	Other
1	2	3	4

5. CLOE:_____

Preschool	Primary	Secondary	Tertiary	Other	Not Attending school	Unknown
1	2	3	4	5	6	7

Mainstream	LSEN	Training Centre	Other	Not Attending School
1	2	3	4	5

6. Type of school:

7. Parental presence/relationship:

In a relationship	Single mother	Single father	Both absent	One deceased	Both deceased	Unknown
1	2	3	4	5	6	7

8. Primary Care Givers:

Biological Parents	Grandparents	Relative	Orphaned	Other	Unknown
1	2	3	4	5	6

9. Parental/ Care giver employment:

Yes	No	Unknown
1	2	3

Source of financial support if unemployed:

_____

10. Dwelling:

Formal House	Informal House	Children's Home	Nongovernmental Residential Facility	Other	Unknown
1	2	3	4	5	6

Neuro-Developmental Disorders	Psychotic Disorders	Mood Disorders	Anxiety Disorders	Trauma and Stress Disorders	Elimination Disorders	Disruptive/Impulse and Conduct Disorder	Substance Use Disorder	Other
1	2	3	4	5	6	7	8	9

Neuro-Developmental Disorders	Psychotic Disorders	Mood Disorders	Anxiety Disorders	Trauma and Stress Disorders	Elimination Disorders	Disruptive/Impulse and Conduct Disorder	Substance Use Disorder	Other
1	2	3	4	5	6	7	8	9

CLINICAL DATA

1. Primary psychiatric diagnosis (es):

2. Comorbid psychiatric diagnosis (es):

3. HIV status:

HIV Positive	HIV Exposed	HIV Negative	Unknown
1	2	3	4

4. ARV treatment:

Yes	No	Unknown
1	2	3

5. Other medical conditions:

_____

6. Current treatment:

Antidepressants	Antipsychotics	Mood Stabilizers/ AED	Psychostimulants	Sedatives	Other
1	2	3	4	5	6

7. Current MDT Management:

OT	Psychology	Social Worker	Speech Therapy	Other	Unknown
1	2	3	4	5	6

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Appendix B: WITS Human Research Ethics Committee – Ethics Clearance Certificate

UNIVERSITY OF THE
WITWATERSRAND,
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RI 4/49 Dr Lerato Makofane

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M180923

NAME: (Principal Investigator)	Dr Lerato Makofane
DEPARTMENT:	Psychiatry Sebei Motsoeneng Primary Health Clinic Johan Heyns Community Health Centre
PROJECT TITLE:	The demographic and clinical profile of HIV affected and non-affected children and adolescents attending two district psychiatric clinics in Gauteng: a retrospective record review
DATE CONSIDERED:	25/09/2018
DECISION:	Approved
CONDITIONS:	Provide written permission to conduct the study from the Clinic Managers.
SUPERVISOR:	Dr Lesley Robertson

Dr C Penny, Chairperson, HREC (Medical)

APPROVED BY:
DATE OF APPROVAL: 13/11/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and ONE COPY returned to the Research Office Secretary in Room 301 ,
Third floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. I agree to submit a yearly progress report. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially

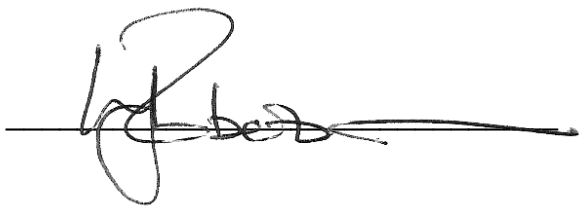
reviewed September and will therefore be due in the month of September each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

_____ _____

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix C: Turnitin Report

Acknowledgement by supervisor: 

Date: _____30 April 2024_____