



**UNIVERSITY of
RWANDA**

**PREVALENCE OF CHILDHOOD ADVERSITIES AMONG PATIENTS WITH
MENTAL DISORDERS ADMITTED IN POST-CRISIS WARDS AT
NDERA NEUROPSYCHIATRIC HOSPITAL**

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a. Declaration by the Student

I, Dr Vianney NYIRIMANA, do hereby declare that the present dissertation is my original work carried out in partial fulfillment of the requirements for the award of the degree of Master of Medicine in Psychiatry at the College of Medicine and Health Sciences. Indeed, this dissertation is not a copy of other authors' work and it has not been published before. I do affirm that I have mentioned a complete list of references indicating all the sources of quoted or cited information. I have corrected this dissertation as recommended by the examiners during its oral defense.

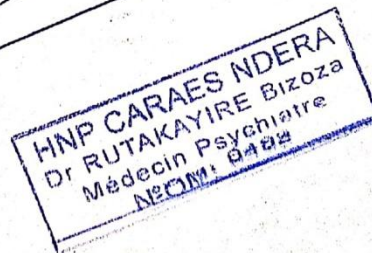
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b. Authority to submit the dissertation

Supervisor: Dr. Bizoza RUTAKAYILE

In my capacity as a Supervisor, I do hereby authorize the student to submit his dissertation.

Dr Bizoza Rutakayile Signature..........Date..17.12.2020



DEDICATION

This dissertation is dedicated to:

My Beloved wife; Josiane MWIZERWA for her care, love, support and encouragement while I was carrying out this study.

All my Brothers and Sisters

All my Friends and my Neighbours

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Praise is to our Lord God for His care and love and has provided me the ability to complete successfully this work.

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DEFINITION OF KEY TERMS

Adverse Childhood Experiences (ACEs): are potentially traumatic events experienced or witnessed during childhood.

Bullying: peer violence.

Childhood Autobiographic Memory Disturbance (CAMD): is memory disruption characterized by the inability to remember events from childhood.

Community violence refers to violence that occurs outside the individual's home within the individual's environment; between or among persons who are not members of the individual's family.

Dissociation: a defense mechanism where certain thoughts or mental process are compartmentalized in order to avoid emotional stress to the conscious mind.

Epigenetics is the study of how gene expression is changed by environmental factors: the underlying code may stay the same but the way DNA is read and translated varies.

Genome: the haploid set of chromosomes in a gamete or microorganism or in each cell of a multicellular organism.

Genotype: a group of organisms having the genetic constitution.

Toxic stress response: Toxic stress response refers to exposure to frequent, prolonged or high level of adversities in the absence of soothing and protective adult.

LIST OF ACRONYMS AND ABBREVIATIONS

ACE-IQ: Adverse Childhood Experiences International Questionnaire

ACEs: Adverse Childhood Experiences

CAMD : Childhood Autobiographical Memory Disturbance

CDC: Center for Disease Control and Prevention

CMHS: College of Medicine Health Sciences

CPA : Childhood Physical Abuse

CSA : Child Sexual Abuse

DNA: Deoxyribonucleic acid

IPV: Intimate Partner Violence

IRB: Institutional Review Board

NPH: Neuropsychiatric Hospital

SPSS: Statistical Package for the Social Sciences

UN: United Nations

UNICEF: United Nations International Children's Emergency Fund

UR: University of Rwanda

WHO: World Health Organization

ABSTRACT

Background: The world needs to keep children's physical and mental wellness through responsive caregiving in order to provide well educated and healthy adult population with enough skills to overcome significant burden related to socio-economic challenges. However, previous studies have established a strong link between Adverse Childhood Experiences (ACEs) and poor adult health outcome. This study aimed to assess the prevalence of childhood adversities among patients with mental disorders admitted in post-crisis wards at Ndera-NPH.

Methodology: The researcher used a descriptive cross-sectional design and quantitative method. The tool was the adapted Adverse Childhood Experiences International Questionnaire (ACE-IQ). A convenience sampling method was applied during 4 weeks. The measured outcomes were participants' ACEs and ACE scores. The data were analyzed using descriptive statistics and Pearson correlation coefficient.

Results: A total of 122 patients accepted to participate: 43.4% were female, 61% had below 35 years old, 67.2% had at most primary school grade and 29.5% did not work during the last 12 months. The most frequent ACE was the child with separated, divorced or died parents; it was notified by 64.8% of participants. The less reported ACE was child sexual abuse with 30.3%. Nearly all (98.4%) participants reported at least one ACE. No correlation was identified between patients' ACE score and their level of education or with regard to their work status.

Discussion and conclusions: This ACE study has provided important data in advancing our insight on high prevalence of ACEs in patients with mental disorders given that nearly all participants have experienced at least one ACE. The lack of correlation between patients' ACE score and their level of education and their work status may be interpreted in term of resilience developed through responsive caregiving, good educational experiences, and opportunities to exert valued social roles. So, there is urgent need to implement required interventions necessary for ACE prevention as well as to mitigate their negative effects on child development and to improve adult health outcome.

Keywords : Adverse childhood experiences, toxic stress response, trauma-informed care

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CHAPTER 1: INTRODUCTION

1.1. Background

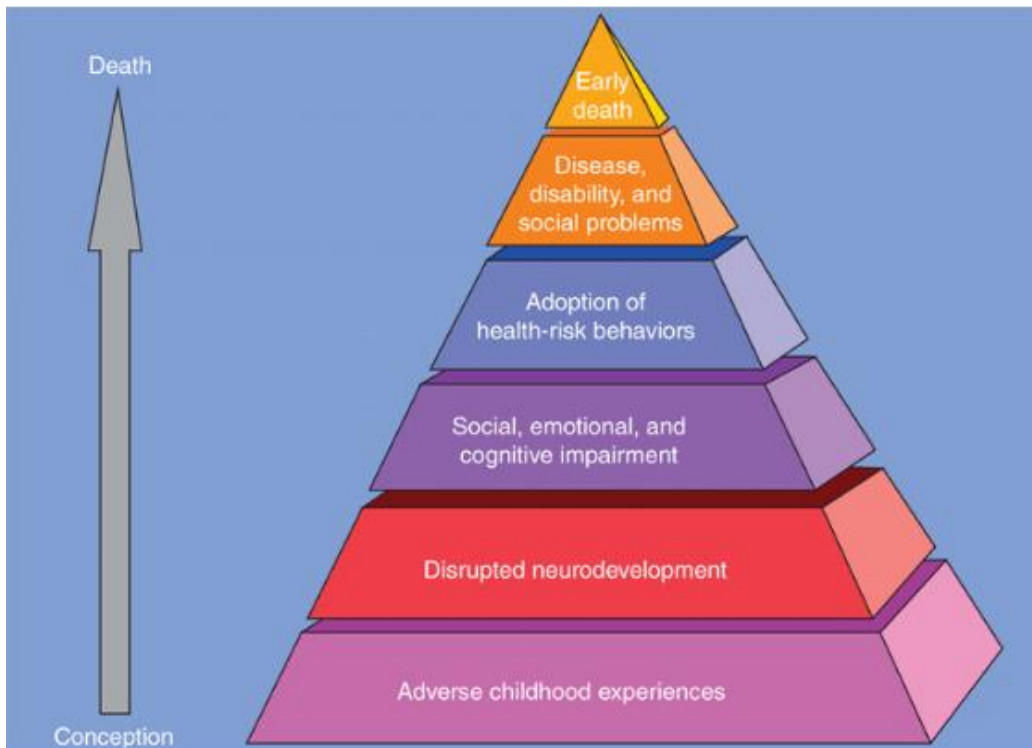
The world is dealing with a significant socio-economic burden that must be addressed to secure a favourable future (Jenkins et al., 2011). To overcome those challenges, nations must provide well educated and healthy adult population; qualified enough to participate effectively in global economy (O'Donnell & O'Donnell, 2016). In order to achieve this goal, children would be the target population because when they have been favored to grow up loved, protected, healthy and educated, we reap collective rewards that change lives as they change the world (*UNICEF Annual Report 2017 | UNICEF Publications | UNICEF, n.d.*).

Responsive caregiving has long-lasting effects on child's physical and mental wellness, fewer behavioural problems and less involvement in social services and criminal justice systems in adulthood (Johnson et al., 2013; Widom et al., 2018). However, children with history of insecure attachment and lack of love and trust are more likely to vent their childhood rage and pain to the community during adulthood (P. M. Miller et al., 2000). This causal relationship between Adverse Childhood Experiences (ACEs) and poor health outcome was first explored in 1998 by the Center for Disease Control and Prevention (CDC) along with Kaiser Permanente Clinic in the study documenting a link between ACEs and later health outcome (Felitti et al., 1998). The ACEs include but not limited to child abuse and neglect and growing up in violent community or/and in dysfunctional household characterized by domestic violence, mental illness, incarceration of a household member, parental divorce or separation and household drug or alcohol abuse (World Health Organization, 2018).

Regarding child physical, emotional and sexual abuse, children are placed in threatening situation which may result in physical and emotional harm. The state of physical and emotional neglect involves the lack of essential experiences for physical and emotional development (Bick & Nelson, 2016; Green et al., 2010; LeTendre & Reed, 2017). George Engel (1977), the American internist – psychiatrist, has introduced the biopsychosocial notion in medical practice wherein health and illness occur as consequences of the interaction between biological, psychological, and social factors and later on, many publications have demonstrated the strong connection between childhood trauma and adult diseases and premature death (Engel, 1977; Felitti, 2019).

1.1.1. The ACE effects on health

ACEs give rise to toxic stress response which is the origin of childhood trauma. This childhood trauma may disrupt neurodevelopment. The disrupted neurodevelopment results in cognitive, emotional and social dysfunction. Individuals with this dysfunction may be at increased risk of health-harming behaviours, disease, disability and premature death (Kimberg & Francisco, 2019; *Mechanisms by Which Adverse Childhood Experiences Influence Health and... | Download Scientific Diagram*, n.d.).



Source: T.E. King, M.B. Wheeler: Medical Management of Vulnerable and Underserved Patients: Principles, Practice, and Populations, Second Edition, www.accessmedicine.com Copyright © McGraw-Hill Education. All rights reserved.

Mechanisms by which adverse childhood experiences influence health and well-being throughout the lifespan. (From <https://captus.samhsa.gov/prevention-practice/targeted-prevention/adverse-childhoodexperiences/1>.)

The link between ACEs and health outcome is complex. It likely involves both direct physiological damage with disrupted neurodevelopment resulting from unsafe child exposure to stressors as well as indirect effects through adopting risky soothing behaviours as a way of coping with ACEs (Sterling et al., 2018).

The stress enters the body through activating stress response system. This system is a neuro-endocrine –immune network calibrated in early life period to respond optimally to stressors (Bottaccioli et al., 2019). The amygdala is the brain fear center that alerts the body to the present dangerous situation. It triggers a cascade of biochemical reactions so that the body could get high level of energy required to fight or fly from the current threat (Koch et al., 2017). The activated stress response system results in increased levels of stress hormones and other mediators that include elevated inflammatory cytokines (G. E. Miller et al., 2011). Even if short-term release of above substances are protective and essential for survival, too much or prolonged exposures can be harmful to health (Berens et al., 2017; Koss & Gunnar, 2018).

1.1.2. Positive, tolerable and toxic stress responses

The National Scientific Council on the Developing Child has established 3 different categories of stress responses in early childhood (National Scientific Council on the Developing Child, 2014; Shonkoff, 2010). Positive stress response refers to mild or moderate activation of stress response system with the availability of a protective adult who helps the child to stand at ease so that he can observe, learn, practice healthily and gain experience. Tolerable stress response refers to exposure to severe adversity in the hand of responsive caregiver that facilitates child to calm down. Toxic stress response refers to exposure to frequent, prolonged or high level of adversities in the absence of soothing and protective adult (Franke, 2014; Szilagyi, 2012).

Neurobiological studies revealed that toxic stress response may target brain structures with rapid development such as synaptic overproduction, synaptic pruning and myelination with different brain regions and pathways. Thus, witnessing domestic violence is associated with alterations in visual cortex and visual-limbic pathways. Exposure to verbal abuse is associated with alterations in auditory cortex and auditory pathways. CSA is associated with thinning of genital representation area of somatosensory cortex in females (Cassiers et al., 2018; Schalinski & Teicher, 2015).

The main effect of toxic stress response during developmental period is to set this stress response system into a dysregulated pattern. This disrupted stress response system affects not only the nervous system but also the immune system, the hormonal system, the cardiovascular system, gastrointestinal system, other systems as well as the way the DNA is expressed (Robert F. Anda et al., 2006).

Toxic stress response from ACEs may have intergenerational effects: those individuals with ACEs are more likely to engage in behaviours that create potential ACEs to their children (M Buisman ID et al., 2020; Merrick et al., 2019).

ACEs are common worldwide. ACEs surveys can provide essential information linking childhood experiences and adult health helpful for the development of appropriate interventions early in life (M. Bellis et al., 2017; M. A. Bellis et al., 2014). However, higher incidence of ACEs appears in countries with low incomes (M. A. Bellis et al., 2014; Health Organization & Office for Europe, 2013) and studies in this field are still scarce especially in Africa.

One study in Uganda revealed that both ACEs and exposure to traumatic war experiences increase the likelihood of mental disorder development among post-war adolescents (Okello et al., 2014). Another study done in Kenya about ACEs has found high prevalence of ACEs among inpatients with substance use disorders (Kiburi et al., 2018). Study on ACEs in South Africa have found the relationship between childhood adversity, recent stressors and depression among students attending university (Mall et al., 2018). In Rwanda, the survey on violence against children revealed that young people are more likely to experience physical, emotional and sexual violence (*Violence Against Children and Youth Survey Republic of Rwanda Republic of Rwanda*, n.d.).

1.2. Statement of the problem

Childhood is the foundation of adulthood health outcome reason why UNICEF is striving to increase global investment in early childhood development (*UNICEF Annual Report 2017 / UNICEF Publications / UNICEF*, n.d.). Despite this insight, ACEs remain an important unaddressed public health issue that our communities are confronting today. The few cases of ACEs perceived from social media represent only a small part of the problem, as many cases remain hidden far from our sight. The lack of information about ACEs in the community contributes to the endemism of children exposure to ACEs. This knowledge gap in clinical services usually leads to less appropriate treatment plan and we lose opportunity to treat childhood trauma known to be the origin of poor health later in life. The chronic failure to break this cycle exacerbates pernicious effects of ACEs on socio-economic challenges related to social problems, disabilities and diseases including mental disorders.

1.3. Research question

What is the prevalence of childhood adversities among patients with mental disorders admitted in post-crisis wards at Ndera-NPH?

1.4. Objectives

1.4.1. Main objective

To assess the prevalence of childhood adversities among patients with mental disorders admitted in post-crisis wards at Ndera-NPH.

1.4.2. Specific objectives

To document patients' socio-demographic variables.

To determine the prevalence of ACEs among patients suffering from mental disorders.

To assess the correlation between ACE scores and patients' socioeconomic variables.

1.5. Relevance of the study

This study would contribute to improvement of mental health care delivery through addressing this problem from the grassroots. Given that no ACE study has been done in Rwanda yet, our findings would clarify the ACE burden in patients with mental disorders. In the community, our results would motivate the establishment of best interventions for ACE prevention. Using ACE screening tool in clinical practice would facilitate to make appropriate treatment plan.

CHAPTER 2: LITTERATURE REVIEW

ACEs constitutes a public health problem worldwide: the global minimum estimation of past-year violence to children aged between 2 and 17 years old is 64% in Asia, 56% in Northern America, 50% in Africa, 34% in Latin America, and 12% in Europe (Hillis et al., 2016). Survivors of childhood maltreatment have multiple overlapping psychiatric disorders and several health conditions from trauma-related disorders according to previous research studies (Bremner et al., 2003; Caspi et al., 2003; Kendler et al., 2013).

2.1. Child maltreatment

The global prevalence of child physical abuse (CPA) has been estimated at 25% with significant variability across the world: 12.0% and 27.0% in Europe and 50.8% and 60.2% in Africa for girls and boys respectively. Some African countries have very high prevalence of child physical abuse such as Zimbabwe with 64% and 76%, Kenya with 66% and 73% for males and females respectively (Cui et al., 2018; Maltreatment, n.d.; Moody et al., 2018).

On the other hand, the prevalence of child emotional abuse were estimated to 28.4% versus 13.8% in North America and 12.9% versus 6.2% in Europe for girls and boys respectively (Moody et al., 2018). South Africa's first prospective cohort study revealed 20.7% for frequent emotional abuse victimization. Lifetime prevalence of emotional abuse of girls in Swaziland was 28.5% with 58.3% of these girls have undergone many abusive incidents (Meinck et al., 2015, 2017).

Child sexual abuse (CSA) is the most investigated category of child maltreatment (Girgira et al., 2014; Hébert et al., 2016; Tonmyr & Gonzalez, 2015). It is estimated that 25 % of girls and 9 % of boys are exposed to any form of CSA worldwide (*Evaluation of Sexual Abuse in Children and Adolescents - UpToDate*, n.d.). Its median prevalence of 20.4% (13.2% to 33.6%) was found in North America and 28.8% (17.0% to 40.2%) in Australian girls, with lower rates generally for boys (Moody et al., 2018). The prevalence of CSA in Sub-Saharan countries ranged from 1.04% to 5.84% (Yahaya et al., 2013). In Rwanda as well as other LMIC, children engage in transactional sex as a survival means in response to adversities such as economic deprivation, difficulty accessing school, and social pressure (Tonmyr & Gonzalez, 2015). Besides, having CSA history as a boy by the age 10 years or younger has increased the risk of impregnating a teenage girl by 80 % and having been exposed to domestic violence with sexual abuse have increased the risk by 110% (R. F. Anda et al., 2001).

The prevalence of child neglect is high in South and North America, Africa and Asia. It is higher for girls than for boys in some parts of the world : 40.5% versus 16.6% in North America, 41.8% versus 39.1% in Africa and 26.3% vs 23.8% in Asia. In other areas of the world child neglect is lower in girls than in boys :13.9% versus 14.8% in Europe and 54.8% versus 56.7% in South America (Moody et al., 2018; Stoltenborgh et al., 2013). The prevalence of childhood emotional neglect is 21.1% in patient with bulimia nervosa and 66% in patient with binge eating disorders (Kimber et al., 2017). Moreover, child neglect is often seen in conjunction with child abuse and constitute chronic form of child maltreatment; 71% of child maltreatment fatality are due to neglect alone or in combination with other maltreatment type (American Academy of Pediatrics, 1998; *Child Neglect: Evaluation and Management - UpToDate*, n.d.; Welch & Bonner, 2013).

2.2. Dysfunctional household

More than one third of all women worldwide undergo male intimate partner violence (IPV) in their lifetime. Its highest global incidence occurs in South Asia, and Latin America, sub-Saharan Africa (Tausch, 2019). Even if men also experience IPV, women are more likely to experience severe or fatal injuries from violent male partners (Mannell & Dadswell, 2017; WHO, 2013). Globally, the highest prevalence of IPV among pregnant women is found in Africa (57%) in the systematic review that has included 13 studies (Shamu et al., 2011). Furthermore, 70.0% of IPV perpetrators had history of child exposure to inter-parental violence and having high ACE score were associated with both physical and emotional IPV perpetration (Gilchrist et al., 2017).

In USA, 43% to 50% of first marriages end in divorce, and 50% of American children will see their parents' divorce. The rate of divorce in many western countries is between 25% to 33% (Oren & Hadomi, 2020). In the Swedish children, 3.7 % had experienced one parent's death and 0.1 % had experienced the death of both parents. It is clear that parents' divorce is associated with poor child health outcome across several domains of well-being, such as behavioural problem, ill health, emotional dysregulation, relationship instability and poor socioeconomic attainment in adulthood (Raley & Sweeney, 2020).

Alcohol is an important risk factor for global burden of disease (Rehm, 2016). The WHO estimated that more than 5% of adults had a current alcohol use disorder worldwide. Its prevalence in primary care has been found to range from 20 to 36% (*Approach to Treating Alcohol Use Disorder - UpToDate*, n.d.).

Alcohol-related disorders among parents are more likely to lead to impairment of the home environment, parenting skills, parent-child relationship, raising levels of conflict, hostility and violence (Maloney et al., 2010).

Globally, it is estimated that between 15% and 23% of children live with a parent with mental illness (Patrick et al., 2019a). Attachment theorists believe that a child's first attachment experience has a profound impact on the child's cognitive and emotional development (Harder et al., 2015). Some studies has found that children of mothers with mental illness were more likely to have insecure attachment (Hipwell et al., 2000). Gelkopf and Jabotaro (2013) assessed maternal self-efficacy among mothers with mental illness and found that participants considered themselves as lacking in parenting skills and there was impairment in their ability to utilize their parenting knowledge (Gelkopf & Jabotaro, 2013).

Baumrind (1968) classified parenting styles into three groups: (a) authoritarian parents use power, command and punitive measures to direct their children's behaviours,(b) authoritative parents are those ones who are able to deal with their children rationally using reasoning to explain current decisions and it is the best parenting style and (c) permissive parents tend to lower their children's expectations by allowing them to regulate their own behaviours. Strong links have been established between maternal mental illness and permissive parenting style (Patrick et al., 2019a, 2019b; Schnuck & Handal, 2011).

2.3. ACEs and the community

Data split by gender from 126 countries on bullying revealed that average bullying rates was 36.1% and 32.1% for boys and girls respectively. There was variation on the prevalence of bullying across countries from 7.1% in Tajikistan to 81% in Botswana (Richardson & Fen Hiu, 2018). Moreover, bullying victim as well as bullying perpetrator are associated with poor child and adult health outcome (Copeland et al., 2013). Bullying perpetrators exhibit higher risk-taking behaviour, as well as later criminal offending (TTOFI et al., 2011). Bullying victim tends to develop depression, anxiety and declining in school performance as well as long-term impairment of child's cognitive, emotional and social development (Huston et al., 2008; Richardson & Fen Hiu, 2018).

The term community violence refers to violence that occurs outside the individual's home within the individual's environment; between or among persons who are not members of the individual's family (DeCou & Lynch, 2017). The risk of child exposure to community violence is great for low-income urban African American adolescents where such exposure can occur on a daily basis (Velsor-Friedrich et al., 2015). The rates of child exposure to community violence were highest among youth from African American (54.4%) and Hispanic (42.9%) adolescents compared with rates of community violence exposure in White (21.8%), and Asian (21.8%) youth (Chen et al., 2016). Children exposed to community violence have high risk to develop internalizing and externalizing symptoms than children without history of community violence (Haj-Yahia et al., 2018; Yearwood et al., 2017).

Collective violence is defined as the use of physical force or power as a group members against another group of individuals with the purpose to achieve social, political or economic benefit (Krug et al., 2002; Quiroga et al., 2015). More than 2 million children worldwide have died as a direct result of armed conflict over the last decade, 20 million homeless, and another million orphaned or separated from their families. During such violence, the armed groups may destroy infrastructure such as schools, health institutions, business, food production and distribution and social cohesion, leading to insecurity, unpredictability and disorder in families' daily life that would support healthy child development (Klevens, 2011).

ACEs tend to occur in cluster so that the presence of one ACE increases the risk of having additional ACEs: about two-thirds of individuals reported at least one ACE and 87% of individual who reported one ACE reported at least one additional ACE (Campbell et al., 2016; Iniguez & Stankowski, 2016). Another example was identified in the prevalence of ACEs in outpatients with affective disorders where 77.2% of patients reported at least 1 ACE and 58.7% reported multiple ACEs (van der Feltz-Cornelis et al., 2019).

ACE researchers found the correlation between household dysfunction and different types of child abuse and neglect (Dong et al., 2004; Dube et al., 2003; Felitti et al., 1998; Soares et al., 2016; Vervoort-Schel et al., 2018). This interrelatedness between ACEs suggests that they cannot be regarded as independent events during ACE assessment but it would be an evidence that different forms of ACEs share the same interacting factors at individual, family and social levels (Soares et al., 2016).

Studies also revealed that the likelihood of developing poor health outcome increased with the ACE score (Health Organization Regional Office for Europe, 2014). The ACE score of 5 increases two-fold the likelihood of chronic headache complaints compared to persons with ACE score of 0 (R. Anda et al., 2010). The ACE score of 6 or more were 5.9 times more likely to have childhood autobiographical memory disturbance (CAMD) compared to participants with an ACE score of 0 (Brown et al., 2007). Chronic sleep disorders are more likely to result from early childhood adversity (Wassing et al., 2019). Having ACE score of 7 or more increases five-fold the risk of notifying hallucinations compared to persons with ACE score of 0 (Whitfield et al., 2005). There is also link between high ACE score, school non completion, unemployment and living in poor socioeconomic conditions (Metzler et al., 2017).

2.4. ACEs in low income settings

Furthermore, a higher prevalence of ACEs appears in low income countries where there is paucity of ACE studies especially in Africa (M. A. Bellis et al., 2014; Health Organization & Office for Europe, 2013). A study conducted in four sub-Saharan African countries (Ghana, Burkina Faso, Uganda and Malawi) about self-reported drunkenness has found high prevalence of ACEs among adolescents with drunkenness over past years: 10% of males and 4% of females having had one ACE and 29% of males and 14% of females who had had 3 or more ACE (Kabiru et al., 2010). Another study done in Kenya about ACEs has found high prevalence of ACEs among inpatients with substance use disorders: 92.5% of substance-abusing participants have reported at least one ACE (Kiburi et al., 2018).

There is still a knowledge gap in our country about the prevalence of ACEs in general population and the same gap still exists among patients with mental disorders that we meet every day. The data obtained will inform policy makers, and clinicians about the magnitude of ACEs in patients with mental disorders.

CHAPTER 3: METHODOLOGY

3.1. Study description

This study aimed to assess the magnitude of ACEs among inpatients with mental disorders. We used a questionnaire-based interview. ACE-IQ was designed for people with 18 years old and above by the WHO to measure ACEs in all countries (World Health Organization, 2018). It has also been a validated tool to measure ACEs in Africa (Kazeem, 2015). It has the section that captures data on participants' socio-demographic variables: age, sex, ethnic group, marital status, educational level and employment status. We modified this section to remove the variable about ethnic group because it was not applicable to this study population. The ACE-IQ screened physical, emotional and sexual abuse, physical and emotional neglect, household member treated violently, household member with substance abuse, household member with mental illness, incarcerated household member, parental separation, divorced, separated or died parents, peer violence (bullying), community violence and collective violence. To calculate the ACE score, the participant received 1 point to every Yes and 0 to every No that he has responded. The total score was calculated by summing up the number of events the participant was exposed to and it varies from 0 to 13.

3.2. Study design

It was designed as a descriptive cross-sectional study using quantitative method.

3.3. Study site

Ndera Neuropsychiatric Hospital is a national referral health setting for patients with neurologic and psychiatric conditions. It is located in Kigali city in Rwanda. It serves also as the university teaching hospital. This hospital was established by the Congregation of Brothers of Charity in July 1968 and became functional since 1972. Actually, it offers different services: psychiatry, neurology, clinical psychology, ergotherapy and physiotherapy (*NEURO-PSYCHIATRIC HOSPITAL CARAES NDERA » Historique*, n.d.).

3.4. Study population

We have invited all the patients that were admitted in post-crisis wards at Ndera NPH during the study period of 4 weeks from 19/08 to 15/09/2019. Most of those patients had severe mental disorders such as psychotic disorders (schizophrenia spectrum disorders), mood disorders (depressive disorders, bipolar disorders...) and substance-related disorders.

They were referred from critical wards after remission of their symptoms in order to continue care with psychotherapy and rehabilitation as well as preparing them to their social reintegration and outpatient care.

3.5. Selection of study population

3.5.1. Inclusion criteria

Patient aged 18 years and above, receiving inpatient care in post-crisis wards at neuropsychiatric hospital of Ndera during study period and who was able and agreed to give consent.

3.5.2. Exclusion criteria

Every patient under 18 years old, patients not admitted in mentioned wards and patients who were not able or refused to give consent.

3.6. Sampling method

We used convenience sampling method to enroll study participants.

3.7. Procedure at enrolment

Patients received clear explanation about the nature and the purpose of the research project in the language that they understand well; either English or Kinyarwanda. Participation was voluntary. Refusal to participate did not affect their requested services. We proceeded first with mental status examination to rule out active neuropsychiatric symptoms that could hinder successful interview.

3.8. Sample size

The sample size has been calculated as follow: the number of beds is constant and is always 80 beds. Each week, there are at most 30 patients entering those wards according to the places available after discharging other patients. In 4 weeks, there are at most 120 movements of patients and 200 is maximum number of patient movements in 4 weeks. 200 patients fall into relatively small number to allow total population sampling.

3.9. Data management

Data have been kept confidential. Identifying information such as names were not collected in this study. Filled questionnaires were kept in a locked place only accessible by the investigators until they were all computerized. Thereafter, hard copies were destroyed. For electronic documents, I have used a unique login ID and password that have kept those data protected.

3.10. Data analysis

The measured outcomes were participants' ACEs and ACE scores. The data were analyzed using descriptive statistics and Pearson correlation coefficient with Statistical Package for the Social Sciences (SPSS) version 21.

3.11. Ethical consideration

3.11.1. Confidentiality

Each patient has completed an anonymous questionnaire. Data collected for study use have been maintained in a locked cupboard and then, on a password protected computer. The collected information was used for research purpose only.

3.11.2. Informed consent

Participation was voluntary. Participants received clear explanation about the nature and the purpose of the research project. Patients with full commitment to participate have signed an informed consent document and filled the questionnaire.

3.11.3. Ethical approval

Ethical clearance for this study has been requested and obtained from the Institutional Review Board (IRB) of the University of Rwanda (UR)/College of Medicine Health Sciences (CMHS).

3.12. Distribution of responsibility

The principal investigator had the responsibility to conduct and coordinate all the steps of the study under the supervision of the study supervisor. Data collection was carried out by data enumerators under principal investigator's supervision and data analysis was done by the statistician Mr SERUGENDO Jean Baptiste.

CHAPTER 4 : RESULTS

4.1. Sociodemographic characteristics of participants

A total number of 159 patients were admitted in post-crisis wards over the period of 4 weeks. All the patients were invited to participate in this study. Thus, 77% gave their consent and filled questionnaires; 2% refused to participate and 21% were not able to give consent due to their unstable mental status.

Table 1 displays sociodemographic characteristics of participants: 43.4% were female and 56.6% were male and more than half (51.6%) were single. Most of respondents were youth as more than 61% were between 18 and 35 years old. The majority (88.5%) of participants were Rwandans and 25.4% were from Kigali city. Regarding the level of education, the majority of our participants (67.2%) did not go beyond the primary school as the highest level of education. Concerning work status, less than one fifth (19.7%) of the participants have had paid jobs where nearly one third (29.5%) were in total incapacity during the last 12 months.

4.2. The Prevalence of ACEs among inpatients with mental disorders

The prevalence of ACEs among inpatients with mental disorders is shown in **Table 2** and **3**. The most frequent ACE was the child with separated, divorced or died parents (64.8%) and it was more reported by female (73.6%) than male patients (58.0%). The second mostly reported ACE was emotional abuse (58.2%) more common in male (60.9%) patients than female (54.7%) patients. Physical abuse was reported by 55.7% of participants and it was more common in female (58.5%) than male (53.6%) patients. Child exposure to collective violence was notified by 53.3% of patients and it was more reported by female (58.5%) than male (49.3%) patients. Emotional neglect was reported by 50.0% of patients and it was more common in female (52.8%) than male (47.8%). Child exposure to household member who was treated violently was reported by 49.2% of patients and it was more reported by female (62.3%) than male (39.1%) patients. Physical neglect was reported by 47.5% of patients and it was more common in female (52.8%) than male (43.5%) patients. Bullying was notified by 46.7% of patients and male (53.6%) patients reported this violence than female (37.7%) patients. Household drug abuse was stated by 41.0% of patients and it was more common in female (45.3%) than male (37.7%) patients.

Table 1. Sociodemographic characteristics of participants

Variables	Characteristics	% & Freq.	Cumulative % & Freq.
Gender	Female	43.4% (53)	43.4% (53)
	Male	56.6% (69)	100% (122)
Marital status	Single	36.1% (44)	36.1% (44)
	Married	51.6% (63)	87.7% (107)
	Separated/Divorced	8.2% (10)	95.9% (117)
	Widowed	4.1% (5)	100.0% (122)
AGE	15-19	4.9% (6)	4.9% (6)
	20-24	15.6% (19)	20.5% (25)
	25-29	21.3% (26)	41.8% (51)
	30-34	19.7% (24)	61.5% (75)
	35-39	15.6% (19)	77.0% (94)
	40-44	8.2% (10)	85.2% (104)
	45-49	6.6% (8)	91.8% (112)
	50-54	4.1% (5)	95.9% (117)
	55-59	3.3% (4)	99.2% (121)
	60-64	0.8% (1)	100% (122)
Place of birth	Kigali city	25.4% (31)	25.4% (31)
	Eastern Province	23.0% (28)	48.4% (59)
	Western province	13.9% (17)	62.3% (76)
	Northern province	13.9% (17)	76.2% (93)
	Southern province	12.3% (15)	88.5% (108)
	Uganda	4.9% (6)	93.4% (114)
	RDC	2.5% (3)	95.9% (117)
	Burundi	1.6% (2)	97.5% (119)
	Other countries	2.5% (3)	100.0% (122)
Level of education	No formal schooling	4.9% (6)	4.9% (6)
	Less than primary school	27.9% (35)	32.8% (41)
	Primary school completed	34.4% (42)	67.2% (83)
	High school completed	26.2% (32)	93.4% (115)
	University or college completed	6.6% (8)	100.0% (122)
Work status	Not employed with inability to work	29.5% (36)	29.5% (36)
	Not employed with ability to work	42.6% (52)	72.1% (88)
	Retired	1.6% (2)	73.7% (90)
	Student	6.6% (8)	80.3% (98)
	Paid employee	19.7% (24)	100.0% (122)

Child exposure to community violence was notified by 41.0% of patients and male (42.0%) patients related more this event than female (39.6%) patients. Incarceration of household members was reported by 34.4% of patients and it was slightly similar in both sex with 34.0% of female and 34.8% of male patients. Having a household member with mental illness was reported by 32.8% of patients and this ACE was more common in male (34.8%) than female (30.2%) patients. Child sexual abuse was notified by 30.3% of patients and this ACE was higher in female (45.3%) than in male (18.8%) patients.

Table 2: ACEs among participants

N ^o	ACEs	Total % & Frequency /122	% & Frequency of Female/53	Frequency & % of males/69
1	Separated, divorced or died parents	64.8% (79)	73.6% (39)	58.0% (40)
2	Emotional abuse	58.2% (71)	54.7% (29)	60.9% (42)
3	Physical abuse	55.7% (68)	58.5% (31)	53.6% (37)
4	Collective violence	53.3% (65)	58.5% (31)	49.3% (34)
5	Emotional neglect	50.0% (61)	52.8% (28)	47.8% (33)
6	Household member treated violently	49.2% (60)	62.3% (33)	39.1% (27)
7	Physical neglect	47.5% (58)	52.8% (28)	43.5% (30)
8	Peer violence	46.7% (57)	37.7% (20)	53.6% (37)
9	Household drug abuse	41.0% (50)	45.3% (24)	37.7% (26)
10	Community violence	41.0% (50)	39.6% (21)	42.0% (29)
11	Incarceration of household members	34.4% (42)	34.0% (18)	34.8% (24)
12	Household mental illness	32.8% (40)	30.2% (16)	34.8% (24)
13	Sexual abuse	30.3% (37)	45.3% (24)	18.8% (13)

4.3. ACE scores among inpatients with mental disorders

ACE score among participants is mentioned in **Table 3**. Nearly all (98.4%) patients with mental disorders including all (100%) female patients and 97.1% of male respondents have had at least one ACE. 91.8% of respondents have experienced at least 2 ACEs. 86.1% of patients have had at least 3 ACEs. 77.9% of patients have experienced 4 ACEs. 64.8% of patients experienced 5 ACEs and 56.6% of all patients have experienced 6 ACEs. 43.4% of patients have experienced 7 ACEs where 32.0% of them reported 8 ACEs. 26.2% of respondents have related 9 ACEs with nearly similar prevalence among female (26.4%) and male (26.1%) patients. 16.4% of patients had had at least 10 ACEs and males (18.8%) patients reported more ACEs than the female (13.2%) patients.

Table 3: ACE scores among participants

ACEs score	Frequency & total %/122	Cumulative % and Freq.	% & Freq. for females/53	Cumulative % & Freq for females	% & Freq. of males/69	Cumulative % & Freq. for males
12	2.5% (3)	2.5% (3)	3.8% (2)	3.8% (2)	1.4% (1)	1.4% (1)
11	4.1% (5)	6.6% (8)	0.0% (0)	3.8% (2)	7.2% (5)	8.7% (6)
10	9.8% (12)	16.4% (20)	9.4% (5)	13.2% (7)	10.1% (7)	18.8% (13)
9	9.8% (12)	26.2% (32)	13.2% (7)	26.4% (14)	7.2% (5)	26.1% (18)
8	5.7% (7)	32.0% (39)	9.4% (5)	35.8% (19)	2.9% (2)	28.9% (20)
7	11.5% (14)	43.4% (53)	11.3% (6)	47.1% (25)	11.6% (8)	40.5% (28)
6	13.1% (16)	56.6% (69)	15.1% (8)	62.2% (33)	11.6% (8)	52.1% (36)
5	8.2% (10)	64.8% (79)	11.3% (6)	73.6% (39)	5.8% (4)	57.9% (40)
4	13.1% (16)	77.9% (95)	11.3% (6)	84.9% (45)	14.5% (10)	72.4% (50)
3	8.2% (10)	86.1% (105)	7.5% (4)	92.4% (49)	8.7% (6)	81.1% (56)
2	5.7% (7)	91.8% (112)	5.7% (3)	98.1% (52)	5.8% (4)	86.9% (60)
1	6.6% (8)	98.4% (120)	1.9% (1)	100% (53)	10.1% (7)	97.1% (67)
0	1.6% (2)	100% (122)	0.0% (0)	100% (53)	2.9% (2)	100% (69)

4.4. The correlation between patients’ ACE scores and socioeconomic variables

The lack of correlation between the patients’ ACE score and their level of education is indicated in **Table 4**. Correlation coefficient and p value were **r = -0.143** and **p = 0.113** respectively. This **r** value is very close to 0 and **p value** is above **0.05**; there is no correlation between above variables.

The lack of correlation between the patients ‘ACE score and their work status during the past 12 months is mentioned in the **Table 4**. The correlation coefficient and p value were **r = 0.071** and **p = 0.434** respectively. This **r** value is very close to 0 and **p value** is above **0.05**; there is no correlation between above variables.

Table 4: Correlation between the patients’ ACE score and socioeconomic variables

N=122 Correlation between		Pearson Correlation	P value	Significant at
ACE score	Level of education	-0.143	0.115	No
	Work status	0.071	0.434	No

CHAPTER 5 : DISCUSSION

This was the 1st study in Rwanda to assess the prevalence of ACEs among patients with mental disorders. Nearly all (98.4%) patients with mental disorders have had at least one ACE ; the prevalence higher than 52% observed in adults having completed a standardized medical evaluation at Kaiser Permanente' San Diego Health Appraisal Clinic (Felitti et al., 1998; Norman et al., 2012), 85% of adolescents of Brazilian birth cohort (Soares et al., 2016) and 62% of residents of rural regions of Wisconsin (Iniguez & Stankowski, 2016) having experienced at least one ACE. This disparity may be due to different study settings and/or study populations :patients admitted for severe mental disorders in this study versus general populations or outpatients or general medical conditions in above studies.

Close to 78% of this study participants have experienced at least 4 ACEs. This finding was much higher than those from ACE study in outpatients with affective disorders at the Netherlands where 35.6% of patients reported at least 4 ACEs (van der Feltz-Cornelis et al., 2019). This rate difference may be interpreted in terms of sociocultural background of developed countries that put more emphasis on child protection than in low income settings (M. A. Bellis et al., 2014; Health Organization & Office for Europe, 2013). Individuals with 4 ACEs and more have a high risk to develop different health problems including physical and mental disorders and the cost of health care services related to ACEs tends to be high in this population (Robert F. Anda et al., 2006; M. Bellis et al., 2017; Björkenstam et al., 2013; Varese et al., 2012). Those study findings underlined the importance to enquire about the ACE history during every patient's clinical interview.

Nearly 32.0% of patients with mental disorder have undergone at least 8 ACEs; the score associated with adult criminality according to previous researches. Literature suggested that to decrease criminal recidivism, treatment interventions must focus on attempting to heal childhood trauma rather than concentrating on the criminal sentence only (Reavis et al., 2013). Thus, individuals with high ACE score may be more likely to have parents with high ACE score as well (Robert F. Anda et al., 2009).

The most prevalent ACE in our findings was child with separated, divorced or died parents with 64.8% of patients. This finding was higher than 42% of adolescents of Brazilian birth cohort having reported parental separation and 10.1% of them reported parental death (Soares et al., 2016). Indeed, 50% of American children will see their parents' divorce (Oren & Hadomi, 2020).

Descriptively, these data provide insight into some household characteristics that may be more likely than others to maltreat their children : a monoparental home has been associated with high prevalence of child maltreatment especially child neglect (Afifi et al., 2015).

Emotional abuse was notified by 58.2%. This finding was widely elevated in patients with mental disorders as published within other researches using similar population : study from Singapore on psychiatric outpatients rated child emotional abuse at 59.1% (Devi et al., 2019). Moreover, this prevalence was too high compared to the general population as in North America, it was 28.4% versus 13.8% for girls than boys respectively and Europe with 12.9% versus 6.2% for girls and boys respectively (Moody et al., 2018). On the other hand, less care has been taken to emotional abuse than other ACE types probably due to the common wrong belief that it is the least damaging form of ACEs. Despite this perception, previous studies have revealed the greatest consequences of emotional abuse and its harmful effects larger than ACE subtypes in relation to several mental, physical and behavioural health outcome (Liu et al., 2018).

The prevalence of physical abuse varies not only across continents but also across countries as well as across gender. Physical abuse was reported by 55.7% of participants. This prevalence was too high compared to general population where the global prevalence of childhood physical abuse has been estimated at 25%. There is significant variability across the world : 12.0% and 27.0% for girls and boys respectively in Europe (Moody et al., 2018). However, this prevalence slightly identical to that observed across Africa with 50.8% and 60.2% for girls and boys respectively often very high in some African countries such as Zimbabwe with 64% for male and 76% females and Kenya with 66% for males and 73% for females respectively (Cui et al., 2018; Moody et al., 2018).

Exposure to collective violence was reported by 53.3% of patients. This finding appeared to be high compared to the global findings in a systematic review that more than 10% of children is affected by the armed conflicts worldwide. During collective violence, children may undergo direct consequences such as injuries/death, illnesses, disability, exposure to armed conflicts, torture and indirect consequences such as altered physical, emotional and cognitive development, displacement, separation from family, orphaned, limited access to health care and education, children assuming adult responsibilities, lack of access to basic needs such as foods and water, lack of child right and maltreatment (Kadir et al., 2019).

Regarding child neglect, 50.0% have had emotional neglect and physical neglect was reported by 47.5%. These findings were highly similar to the prevalence of child neglect observed in Africa (females: 41.8%, males: 39.1%) and South America (females: 54.8%, males: 56.7%) compared to North America (females : 40.5% and boys : 16.6%) and Asia (girls: 26.3%, boys: 23.8%) (Moody et al., 2018; Stoltenborgh et al., 2013). Indeed, previous studies identified associations between child neglect and motor retardation through attachment difficulties (Bailey et al., 2018).

Exposure to household member who was treated violently was reported by 49.2% of patients. These findings supported the results of previous researches that the prevalence of IPV in African countries is estimated from 26.5% to 48% (Taquette et al., 2019). Furthermore, it has been established a significant relationship between children's health problems and their exposure to their mother being treated violently :there was significant association between child exposure to family conflicts and insomnia later in life (Kajeepta et al., 2015; Roth et al., 2014).

Bullying was reported by 46.7% of patients and it was more reported by male than female patients. This finding was slightly similar to the general population in 40 countries where the range from 8.6 % to 45.2 % and 4.8 % to 35.8 % among boys and girls respectively have experienced bullying (Craig et al., 2009). Researchers have found persuasive evidence of interrelatedness between bullying victimization in children and adverse mental, behavioural and physical outcome later in life. Given those evidences, there is a need for effective actions to be implemented in different institutions caring children especially at school where the high prevalence of children and adolescents engaging in bullying has been found (Moore et al., 2017).

Exposure to a household member with drug abuse was reported by 41.0% of participants. This prevalence was slightly elevated compared to other studies done in other geographical regions of the world. In the USA, 38.5% of perpetrators of family violence were under the influence of alcohol or other drugs at the time of the incident (Durose et al., 2005). Thus, it is credible that children exposed to parental alcohol abuse are more likely to undergo various forms of child maltreatment (Dube et al., 2001; Freisthler & Gruenewald, 2013; Freisthler & Wolf, 2017).

Exposure to community violence was notified by 41.0% of patients. These data fall within the same range of the rates of child exposure to community violence among African American (54.4%), Hispanic (42.9%), White (21.8%) and Asian (21.8%) youth (Chen et al., 2016).

Moreover, witnessing the killing of someone, seeing dead, mutilated bodies and physical attack with weapons have been proven to be the most upsetting traumatic experiences during community violence (Rieder & Elbert, 2013).

Incarceration of household members was reported by 34.4% of patients. Many studies showed that children from incarcerated parents are more likely to develop antisocial behaviour, drug use, or poor educational performance probably due to many difficulties for families and children of prisoners (Murray et al., 2012).

Having a household member with mental illness was reported by 32.8% of patients. These findings were much higher than the range between 15% and 23% of global estimation of children living with parent with mental illness (Patrick et al., 2019a). The literature suggested that mental illness in the household creates a non conducive environment to the optimal development of a child. It is therefore better to detect and treat mental illness during the postnatal period as early as possible to avoid harmful consequences such as insecure infant attachment at 2 and 18 months and maladaptive behaviours of the patients including maltreating their kids (Slomian et al., 2019).

CSA is more frequent in girls than in boys worldwide :25 % versus 9 % (*Evaluation of Sexual Abuse in Children and Adolescents - UpToDate*, n.d.). Our findings revealed that CSA in patients with mental disorders is too high compared to general population because it has been notified by 37 (30.3%) patients and this ACE was 2.4 fold higher in female (45.3%) than in male (18.8%) patients. Interpretation may refer to men's socialization to behave as power holder for sexual initiation where women are traditionally expected to show subordination to men. Consistent with this interpretation, girls are vulnerable to sexual abuse even if prevention and intervention programs should target both genders (Pérez-Fuentes et al., 2013). However, male individuals with history of sexual abuse are more likely to develop psychopathology such as mood disorders and suicidal behaviours than their counterparts (Angelakis et al., 2019; A. B. Miller et al., 2013).

Since this research study has revealed the ACE burden in this study population; they are noxiously devastating our communities as well and contributing to chronic diseases (Dube et al., 2009; Norman et al., 2012) including mental disorders most of which require inpatient care. Previous studies have found the hospitalization as an important indicator of expensive health care while keeping in mind that mental and behavioural disorders are the commonest pathologies responsible for hospital readmissions (Robert F. Anda et al., 2007; Fang et al., 2015; Gryczynski et al., 2016).

The findings of this study have missed the correlation between ACE score and the participants' level of education and between ACE score and participants' work status during last 12 months. These data may be interpreted in terms of resilience that is defined as the capacity to resist or to overcome the damaging effects of the adversity. Some participants have resisted adversities for a long period and 6.6% have completed high level of education at the university and 19.7% have had paid jobs where most of them have successfully held their occupational, social and professional functions before being admitted their symptomatology. Key factors to promote resilience are responsive caregiving, fair treatment, good educational experiences, and opportunities to exert valued social roles (M. A. Bellis et al., 2018).

However, most of this study population did not achieve high level of education where 67.2% did not study beyond the primary school level. They were also economically not functioning given that 42.6% of patients with ability to work, were not employed, 29.% were already in partial or total incapacity during previous 12 months, and 1.6% were retired. Those alarming findings highlighted socioeconomic burden in patients with mental disorders. It is true that ACEs may contribute to this problem but further research studies are encouraged in order to figure out other underlying causes.

Limitations

However, the results of this study have been interpreted within the context of several limitations : First, the list of ACEs as mentioned in ACE-IQ is not exhaustive because recent studies have revealed other forms of ACEs such as separation from a caregiver to foster care, migration and discrimination (Oh et al., 2018). In addition, despite both peer violence perpetrators and victims would have poor adult health outcome; ACE-IQ has considered only the victims and has ignored the perpetrators. Further studies may also investigate if they can mention being born with HIV infection, being born from sex worker parents, teenager and unwanted pregnancy to the list of ACEs given the psychopathology associated with those childhood events that we meet most of the time in our clinical activities.

Second, like other studies on ACEs, the retrospective nature and the self-reported data of the ACE-IQ may limit the ability to document all ACEs with precision due to the possibility of recall error, overestimation or underestimation of those experiences and other retrospective biases.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

This study has provided introductory and useful data in advancing our insight on the high prevalence of ACEs in patients with mental disorders and the paucity of data on ACEs in Rwanda. Early recognition of ACEs with appropriate interventions can mitigate their negative effects on child development and can lead to better health outcome. In adults, insight of their own ACE history can empower their engagement with mental health services. This insight may also provide motivation to learn useful skills helpful to cut off the intergenerational cycle of ACE transmission from parents to children.

6.2. Recommendations

Our findings may serve as groundbreaking public health initiative and it has established several level of ACE prevention in the purpose to improve child health and reduce health-harming behaviour later in life as well as improvement in adult health outcome:

First, it is calling the public, private institutions and other shareholders in relation to child care services to invest in cost-effective interventions such as raising public awareness on harmful effects of ACEs, identification and addressing family problems, training on positive parenting and support further ACE research studies in the purpose to improve child protection in human society.

Second, it is requesting the involvement of all health care providers to prevent the transmission of toxic stress response during pregnancy by engaging both wife and husband including other important individuals such as employers, friends and family members.

Third, it is requiring the introduction of trauma-informed care in our health care systems and to train not only clinicians but also non-clinicians on ACEs and trauma-informed approach in order to help people not only to recognize the origin of their diseases but also to improve therapeutic outcome.

Last, it is urgent to make ACE screening early in childhood and provide an appropriate treatment to the victim in the purpose to tackle the upstreaming problems before their complications and overall long-term pernicious consequences.

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APPENDICES

Appendix 1: Consent form in English

I am Dr Vianney NYIRIMANA, a postgraduate in MMed Psychiatry at the University of Rwanda. I am doing research on the prevalence of adverse childhood experiences that you have faced before you had 18 years old. Every participant will receive the questionnaire. Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you receive at this hospital will continue and nothing will change. You may change your mind later and stop participating even if you agreed earlier. During the research you will be invited:

- To read the consent form carefully and the researcher will explain to you all the content of the questionnaire and afterwards you will voluntarily give your consent before you fill the questionnaire.
- After you have completed the questionnaire, you will hand it to the researcher.

The research takes place over 4 weeks in total. Your participation is likely to help us to find the answer to the research question. This research will be beneficial to the society because it will not only raise awareness of the public about the danger associated with the ACEs but also it will promote protection of our children and help children victim of the ACEs as soon as possible after the incident.

The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and none but the researcher will be able to see it. Any information about you will have a number on it instead of your name. Only the researcher will know what your number is and we will lock that information up with a lock and key. The knowledge that we get from doing this research will be shared and the results will be published in order that other interested people may learn from our research. If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following:

1. Sunday at the Tel: +250788563311 or e-mail: sundayfrax@gmail.com,
2. Professeur Gahutu Jean Bosco at the tel: +250783340040

You can ask me any more questions about any part of the research study, if you wish to.

Certificate of Consent: I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Print Name of Participant

Signature or fingerprint of Participant

Appendix 2: Consent form in Kinyarwanda

URUHUSHYA RWO KWITABIRA UBUSHAKASHATSI

Nitwa Dr Vianney NYIRIMANA, umunyeshuri mu cyiciro cya gatatu mu buvuzi bw'indwara zo mu mutwe muri Kaminuza y'u Rwanda. Ndi gukora ubushakashatsi kubijyanye n'imibare y'abarwayi bahuye n'ingorane mu gihe bari bakiri abana batarageza ku myaka cumi n'umunani.

Uwemeye kwitabira wese azahabwa urutonde rw'ibibazo agomba gusubiza. Kwitabira ubu bushakashatsi ni ku bushake busesuye. Wahitamo cyangwa ukanga kwitabira ubu bushakashatsi, serivisi uhabwa mu bitaro zizakomeza uko zagenwe ari nta gihindutse. Ushobora guhindura icyemezo ukisubiraho nyuma n'ubwo waba wari waremeye kwitabira ubushakashatsi ku ikubitiro. Mu gihe cy'ubushakashatsi muzahamagarirwa:

- Gusoma no kumva neza ibikubiye muri iyi nyandiko noneho umushakashatsi abasobanurire byimbitse urutonde rw'ibibazo byose musabwa gusubiza hanyuma mubone kwemera ku bushake kwitabira ubu bushakashatsi.
- Hanyuma muzahabwa urutonde rw'ibibazo muzasubiza noneho umushakashatsi yakire inyandiko z'ibibazo mwamaze gusubiza.

Ubu bushakashatsi buzamara ibyumweru bigera kuri bine. Ubu bushakashatsi buzagirira akamaro kanini abantu muri rusange kuko butazumvikanisha gusa ubukana bw'ikibazo n'ingaruka mbi ziterwa n'uko umuntu yahuye n'ingorane mu gihe yari akiri umwana ahubwo buzafasha kurinda abana bacu ndetse no kubafasha bihagije kandi byihuse mu gihe bahuye n'ingorane. Amakuru twegeranya muri ubu bushakashatsi azagirwa ibanga kandi abikwe neza ku buryo nta we ushobora kuyageraho uretse njyewe uri gukora ubushakashatsi. Amakuru yose aberekeye azashyirwaho nomero aho kuba amazina yanyu kandi azafungiranywa ahantu mu buryo bwizewe. Hanyuma tuzatangaza ibyavuye muri ubu bushakashatsi kugira abantu bose babishaka bagire icyo babwigiraho.

Igihe mufite ikibazo ubungubu cyangwa nyuma, n'iyi ubushakashatsi bwaba bwararangiye, mushobora kwiyambaza aba bakurikira:

- Professeur Gahutu Jean Bosco: +250783340040
- Bwana Sunday : +250788563311 cyangwa e-mail: sundayfrax@gmail.com,

Mushobora kumbaza ikibazo icyo ari cyo cyose kuri ubu bushakashatsi igihe mushakiye.

Icyemezo cyo kwitabira ubushakashatsi: Maze guhabwa aya makuru. Nahawe umwanya wo kubaza ibibazo kuriyo kandi nahawe ibisubizo bishimishije. Niyemeje, ari nta gahato gaturutse ku bandi, kwitabira ubu bushakashatsi.

Izina ry'uwitabiriye ubushakashatsi

Umukono cyangwa igikumwe

Appendix 3 : Questionnaire in English

A.SOCIODEMOGRAPHIC INFORMATION

N° :...

- a)Sex M F
- b)Age:Date of birth
- c)Place of birth Country:.....
District:.....
- d) What is the highest level of education you have completed? (Choose by **underlining** the appropriate answer)
- *No formal schooling
 - *Less than primary school
 - *Primary school completed
 - *Secondary/High school completed
 - *College/University completed
- e) Which of the following best describes your main work status over the last 12 months? (Choose by **underlining** the appropriate answer)
- *Paid employee
 - *Non paid employee
 - *Student
 - *Retired
 - *Unemployed
- f) What is your civic status? (Choose by **underlining** the appropriate answer)
- *Single
 - *Married
 - *Separated/Divorced
 - *Widowed

B. Answer the following questions by underlining **Yes** or **No**

While you were growing up, during your first 18 years of life:

1. Emotional abuse

Did a parent or other adult in the household **often** insult you, scream at you, put you down, or humiliate you? **Or** Act in a way that made you afraid that you might be physically hurt? **YES**.....**NO**.....

2. Physical abuse

Did a parent or other adult in the household **often** push, grab, slap, or throw something at you? **Or Ever** hit you so hard that you had marks or were injured? **YES**.....**NO**.....

3. Sexual abuse

Did an adult or person at least 5 years older than you **ever** touch or fondle you or have you touch their body in a sexual way? **or** Try to or actually have oral, anal, or vaginal sex with you when you did not want them to? **YES**.....**NO**.....

4. Emotional neglect

Did you **often** feel that none in your family loved you or thought you were important or special? Or parents/guardians did not understand your problems/worries? **YES**.....**NO**.....

5. Physical neglect

Did you **often** feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Or None to take care of you, to send you to school or take you to the doctor if you needed it? **YES**.....**NO**.....

6. Parental separation, Divorce or having one or no parent

Were your parents/caregiver **ever** separated, divorced? or Do you have one or no parents? **YES**.....**NO**.....

7. Household drug or alcohol abuse

Were your parents/caregiver too drunk or intoxicated by drugs to take care of you? or Did you live with anyone who was a problem drinker or alcoholic or who used street drugs? **YES**.....**NO**.....

8. Household mental illness

Was a household member depressed or mentally ill or did a household member attempt suicide? **YES**.....**NO**.....

9. Incarceration of a household member

Did a household member go to prison? **YES**.....**NO**.....

10. Household member treated violently

Did you see or hear a parent or household member in your home being yelled at, screamed at, sworn at, insulted or humiliated? Slapped, kicked, punched or beaten up? Hit or cut with an object, such as a stick (or cane), bottle, club, knife, whip etc.? **YES**.....**NO**.....

11. Peer violence (bullying)

Have you ever been bullied? Being shoved around, being made fun or being completely ignored because of your race, nationality, religion or because of how your body or face looked? **YES**.....**NO**.....

12. Community violence (not in your home or on TV, movies, or the radio)

Did you see or hear someone being beaten up, being stabbed, and shot, being threatened with a knife or gun in real life? **YES**.....**NO**.....

13. Exposure to Collective violence including wars, terrorism, political or ethnic conflicts, genocide, repression, torture and organized violent crime such as banditry and gangs.

Were you forced to go and live in another place? Did you experience the deliberate destruction of your home? Were you beaten up by soldiers, police, militia, or gangs? Was a family member or friend killed or beaten up by soldiers, police, militia, or gangs during one of above violent events? **YES**.....**NO**.....

Appendix 4: Questionnaire in Kinyarwanda

A.AMAKURU KU IRANGAMIMERERE

N°:.....

a) Igitsina Gabo Gore

b) Itariki wavutseho

c) Aho wavukiye **Igihugu**:.....**Akarere**:.....

d) Warize ugarukira hehe ?

(Hitamo **uca umurongo** muni y'igisubizo cyawe

* Sinigeze niga

*Nayacikirije mu mashuri abanza

*Narangije amashuri abanza

*Narangije amashuri yisumbuye

*Narangije kaminuza

e) Muri ibi bikurikira ni iki gisonanura

neza umurimo wawe muri aya

mezi 12 ashize ?(Hitamo **uca**

umurongo muni y'igisubizo cyawe)

*Akazi gahemba umushahara

*Akazi kadahemba umushahara

*Umunyeshuri

*Ikiruhuko (ubumuga, izabukuru)

*Nta kazi nashoboye gukora

f) Irangamimerere (Hitamo

uca umurongo muni

y'igisubizo cyawe)

*Ndubatse

*Ingaragu

*Natandukanye n'uwo twashakanye

*Umupfakazi

B.Subiza ibibazo bikurikira uhitamo **YEGO** cyangwa **OYA**

Igihe wari ukiri umwana utaruzuzwa imyaka 18 y'ubukure:

1) **Ihohoterwa ribabaza umutima**: Ese umubyeyi wawe cyangwa undi muntu mukuru mu rugo yigeze agutuka, agukankamira, agutesha agaciro cyangwa se agukoza isoni? Cyangwa se agutera ubwoba ku buryo byashoboraga kugukomeretsa ku mubiri? **YEGO**.....**OYA**.....

2) **Ihohoterwa ribabaza umubiri**: Ese umubyeyi wawe cyangwa undi muntu mukuru mu rugo yigeze agushushubikanya, agukubita cyangwa se agutera ikintu? Cyangwa se agukubita cyane ku buryo byagusigiye ibikomere? **YEGO**.....**OYA**.....

3) **Ihohoterwa rishingiye ku gitsina**: Ese umuntu mukuru (ukurusha byibura imyaka 5) yigeze agukorakora cyangwa agutegeka kumukorakora agamije kwishimisha? Cyangwa se agukoresha imibonano mpuzabitsina? **YEGO**.....**OYA**.....

4) **Gutereranwa bibabaza umutima**: Ese wigeze wumva ko nta muntu n'umwe wo mu muryango wawe ugukunda cyangwa se wigeze utekereza ko ntacyo umaze? Cyangwa se ababyeyi bawe cyangwa abakureraga batigeraga bita ku bibazo byawe? **YEGO**.....**OYA**.....

5)Gutereranwa bibabaza umubiri: Ese hari ubwo utabonaga ifunguro riguhagije, ukambara imyambaro icitse cyangwa yanduye cyangwa se utari ufite umuntu wo kukurengera mu bihe by'akaga? Cyangwa se utari ufite umuntu wo kukwitaho,ngo akujyane ku ishuri cyangwa se akujyane kwa muganga mugihe byari ngombwa?**YEGO.....OYA.....**

6)Gutandukana kw'ababyeyi,kugira umubyeyi umwe cyangwa se kutagira ababyeyi
Ese ababyeyi bawe baratandukanye? Ese wari ufite umubyeyi umwe? Cyangwa se nta mubyeyi n'umwe ufite?**YEGO.....OYA.....**

7)Ikoresha ry'ibiyobyabwenge n'inzoga mu rugo: Ese ababyeyi bawe/abakureraga bari abasinzi cyangwa se bari imbata z'ibiyobyabwenge kuburyo bitashobokaga ko bakwitaho? Cyangwa se wabanaga n'umuntu wabayeye imbata y'inzoga cyangwa se ibiyobyabwenge?**YEGO.....OYA.....**

8)Uburwayi bwo mu mutwe mu rugo:Ese hari umuntu wo mu rugo wari urwaye mu mutwe cyangwa se yigeze ashaka kwiyahura?**YEGO.....OYA.....**

9)Ifungwa ry'abagize umuryango: Ese hari umuntu wo mu rugo wigeze afungwa?**YEGO.....OYA....**

10)Ihohoterwa ryakorewe umuntu wo mu rugo:Ese wigeze ubona umubyeyi cyangwa umuntu wo mu rugo iwanyu atukwa, abwirwa nabi, akozwa isoni? Akubitwa? Atemeshwa umuhoro cyangwa ikindi kintu gishobora gukomeretsa?**YEGO.....OYA**

11)Ihohoterwa ryakozwe n'urungano rwawe:Ese wigeze ukorerwa ihohoterwa n'abantu bo mu kigero cyawe? Bagushushubikanya, bagushungera, cyangwa se bagushyira mu kato bakuziza ubwoko bwawe, aho ukomoka, imyemerere yawe cyangwa se baguhora uko umubiri wawe uteye?**YEGO.....OYA**

12)Ihohoterwa ryakorewe undi muntu (umuntu utari uwo mu rugo iwanyu, bitari n'ibyo wabonye kuri televiziyo cyangwa wumvise kuri Radiyo):Ese wigeze ubona umuntu ahondagurwa, asogotwa, araswa cyangwa se akangishwa icyuma cyangwa imbunda?**YEGO.....OYA.....**

13)Ihohoterwa ryakorewe rubanda nyamwinshi nk'intambara, ibikorwa by'iterabwoba, ubushyamirane mu bya politiki, genoside, kubuzwa uburenganzira, kwicwa urubozo, cyangwa se ibindi bikorwa biteye ubwoba nk'iby'amabandi.

Ese mwigeze mumeneshwa ngo muve aho mwari mutuye? Ese mwigeze mubona inzu yanyu isenywa mu gihe cy'ihohoterwa ryabakorerwaga? Ese mwaba mwarakubiswe n'abasirikari, abapolisi cyangwa se abantu bitwaje intwaro? Ese hari umuntu wo murugo cyangwa se inshuti yanyu yigeze yicwa cyangwa se ahondagurwa n'abasirikari,abapolisi cyangwa se abantu bitwaje intwaro? **YEGO.....OYA.....**

Appendix 5: CMHS IRB approval document



UNIVERSITY of
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES
DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 19th/07/2019

Dr NYIRIMANA Vianney
School of Medicine and Pharmacy, CMHS, UR

Approval Notice: No 355/CMHS IRB/2019

Your Project Title *“Prevalence Of Childhood Adversities Among Patients With Mental Disorders Admitted In Post-Crisis Wards At Ndera Neuropsychiatric Hospital ”.* has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS	X		
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Asiimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 19th July 2019, **Approval has been granted to your study.**

Please note that approval of the protocol and consent form is valid for **12 months.**

Email: researchcenter@ur.ac.rw

P.O Box 3286 Kigali, Rwanda

www.ur.ac.rw


You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.
2. Only approved consent forms are to be used in the enrolment of participants.
3. All consent forms signed by subjects should be retained on file. The IRB may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to the IRB in a timely fashion and before expiry of this approval
5. Failure to submit a continuing review application will result in termination of the study
6. Notify the IRB committee once the study is finished

Sincerely,

Date of Approval: The 19th July 2019

Expiration date: The 19th July 2020


Professor GAHUTU Jean Bosco
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

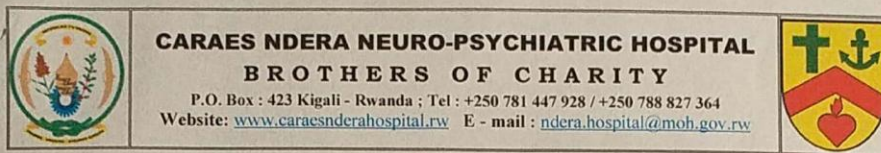
- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

Email: researchcenter@ur.ac.rw

P.O Box 3286 Kigali, Rwanda

www.ur.ac.rw

Appendix 6: NPH Ethic committee approval document



CARAES NDERA HOSPITAL ETHICS COMMITTEE

Ndera, August 21, 2019

N° 009/CNEC/2019

Principal Investigator: Mr. Vianney NYIRIMANA,
Master's Degree of Medicine (*Psychiatry*)
candidate at The University of Rwanda

Your research Project: **“Prevalence of Childhood Adversities Among Patients with Mental Disorders Admitted in Post-Crisis Wards at Ndera Neuropsychiatric Hospital”** has been evaluated by CARAES NDERA Hospital Ethics Committee.

Members of Ethics Committee - CARAES Ndera Hospital			Involved in the decision		
N°	Names	Position	Yes	Absent	Withdrawn from the proceeding
1.	Dr. Fidele SEBERA	Director of Medical & Allied Health Sciences Services / Neurologist – <i>CNEC Chairperson</i>		X	
2.	Br. Eric Ferdinand TWIZEYIMANA	Director of Education, Research, CPD and Quality Improvement – <i>CNEC Co-Chairperson</i>	X		
3.	Josiane UMWIRINGIRWA	Research assistant – <i>CNEC Secretary</i>	X		
4.	Alain NYAMWASA	Data Manager		X	
5.	Israel IRAZIRIKANA	Legal Advisor		X	
6.	Rosine MUKAMUSONI	Customer care officer	X		
7.	Ernestine RUDASINGWA	Reception Service – Representative	X		
8.	Claire UMUHOZA	CARAES Butare – Representative	X		
9.	Clemence UWAMAHOHO	Centre ICYIZERE – Representative	X		
10.	Vestine MUKAYISIRE	Psychiatry Department – Representative	X		
11.	Jeanne d'Arc MAZIMPAKA	Neurology Department – Representative	X		

After reviewing your protocol, questionnaire and consent forms presented during the CARAES NDERA Hospital Ethics Committee (CNEC) meeting of Tuesday, August 20, 2019 where quorum was met, **we hereby provide approval for the above-mentioned protocol.**

Please note that the approval of the protocol is valid for **12 months.**

1

You are responsible for fulfilling the following requirements:

1. Changes, amendments and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of changes.
2. Only approved consent form to be used in the enrollment of participants.
3. All consent forms signed by subjects should be retained on file, the CNEC may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to CNEC in a timely fashion and before expiry of this approval.
5. Failure to submit a continuing review application will result in termination of the study.
6. Notify CARAES NDERA Hospital Ethics Committee once the study is finished.
7. Submission of a **final copy of research findings** to the hospital is **mandatory**.

Sincerely,

Date of Approval: August 20, 2019

Expiration date: August 19, 2020

Br. Eric Ferdinand TWIZEYIMANA



Co-Chairperson, CARAES NDERA Hospital Ethics Committee



C.C:

- Director General of CARAES NDERA Neuropsychiatric Hospital
- Director of Education, Research, CPD and Quality Improvement

2