# The prevalence and risk factors of symptoms of depression, anxiety and somatic syndromes among secondary school students in Kampala, Uganda

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Dissertation presented for the degree of MPhil in Public Mental Health in the Faculty of Arts and Social Sciences at Stellenbosch University

Date: March 2018

# Declaration

I James Roger Nsereko, hereby declare that the work contained in this thesis is my original work. I have not previously (in its entirety or in part) submitted it to any institution for any award.

Signed:

James Roger Nsereko

Date : March 2018

# Abstract

**Aim:** The aim of this study was to investigate the prevalence of symptoms of depression, anxiety and somatic syndromes and to examine the association of these conditions with socio-demographic factors (i.e. age, gender and family composition) in secondary school students in Kampala.

**Methods:** Participants were selected from six schools, randomly drawn from Nakawa and Makindye division in Kampala, Uganda. The participants were 549 adolescents, aged 14-17 years. Participants completed a battery of measures including a socio-demographic questionnaire, Youth Self-Report (YSR) - DSM oriented scales for depression, anxiety and somatic syndromes. Descriptive, bivariate and multivariate analysis were used to determine the prevalence of depression, anxiety and somatic syndromes and associations between these syndromes and demographic variables.

**Results:** Prevalence of symptoms of depression was 21.1% (95% CI 17.8% -24.6%), anxiety was 38.5% (95% CI 34.9% - 42.6%) and somatic syndromes was 42% (95% CI 37.8% - 45.9%). There was a high comorbidity among conditions under study, with 31.4% of respondents meeting the criteria for at least two conditions. Symptoms of depression were significantly associated with gender, religion, and living arrangement. Symptoms of anxiety were only associated with gender, whereas somatic syndromes were significantly associated with gender, and living arrangement.

**Conclusion:** Symptoms of depression, anxiety and somatic syndromes were prevalent among adolescents in schools in this study. Findings indicate that girls were more at risk of developing symptoms of depression, anxiety and somatic syndromes than boys. Furthermore adolescents not living with their biological parents were more vulnerable to depression and somatic

syndromes than those living with both parents. These findings highlight the need to put in place mechanisms for monitoring and addressing psychological problems in schools.

## Acknowledgement

In a special way, I would like to thank my supervisor Dr. Rizwana Roomaney for the guidance and mentorship, motivation and inspiration that has enabled me to produce this piece of work. Your reflective questions have helped me to deeply reflect on concepts. I also thank you for being patient with me and being supportive whenever I had challenges.

I would also want to thank the AFrica Focus on Intervention Research for Mental health (AFFIRM) project for extending me the opportunity to do this MPhil program. My MPhil (Public Mental health) program and this study have been sponsored by the AFFIRM project. I also extend my thanks to the entire AFFIRM fraternity, Dr. Katherine Sorsdahl for the mentorship and support. Thank you for inspiring us to be innovative researchers.

I also thank the adolescents who participated and all those who wanted to but did not have a chance. Thank you for understanding the importance of research. Thank you for representing adolescents in school in various parts of the world.

To my special circle of friends, and my family. Thank you for sparing time to encourage, support and refocus me.

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# Chapter 1

# Introduction

## 1.1 Background

Up to 20% of children and adolescents worldwide have a mental disorder of some sort (Kieling et al., 2011). The Diagnostic Statistical Manual for Mental Disorder (version 5) (DSM 5) defines a mental disorder as a syndrome characterized by a clinically significant disturbance in an individual's cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning (American Psychiatric Association, 2013).

Mental disorders are leading contributors to Disability Adjusted Life Years (Whiteford et al., 2013). Mental health problems such as depression and anxiety are prevalent in children and adolescents and significantly interfere with functioning (Abbo et al., 2013; Cortina, Sodha, Fazel, & Ramchandani, 2012; Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013). The World Health Organisation places significant importance on adolescent mental health because most mental health problems originate in late childhood or early adolescence (Kessler, et al., 2005). Epidemiological studies have shown that depression contributes a substantial portion of global burden of disease (Whiteford et al., 2013). The biggest burden of depression and other mental health problems is experienced in low and middle-income countries (Naghavi & Forouzanfar, 2013).

Few studies in Africa have examined the prevalence of mental health problems among children (Cortina et al., 2012). In Uganda, the research focus has been on children in war torn environments in northern Uganda (Abbo et al., 2013; Kinyanda, Kizza, Levin, Ndyanabangi, & Abbo, 2011; Kinyanda et al., 2013; Mugisha, Muyinda, Malamba, & Kinyanda, 2015).

Studies have also targeted particular groups of children, such as those receiving care for HIV/AIDS (Musisi & Kinyanda, 2009). Accounts of mental health problems in schools manifesting as demonic attacks have been reported (Kokota, 2011; Nakalawa, Musisi, Kinyanda, & Okello, 2010) but health care records show that few children and adolescents with mental, neurological or substance use disorders receive treatment (MoH, 2017).

One of the challenges facing mental health care in Uganda is the limited budget that mental healthcare receives annually. For example, mental health receives less than 0.7 % of national health spending in Uganda (MoH, 2017). In addition, there is a scarcity of mental health professionals in Uganda, with most working at national referral hospitals (Kigozi et al., 2010). Mental health policy has acknowledged the importance of child and adolescent psychological well-being. The child and adolescent mental health policy emphasised the need to establish mental, neurological and substance use services in schools (MoH, 2017). In order to effectively plan for mental health services in schools there is need to determine the prevalence of mental health problems in school environments.

## 1.2 Significance of the study

One in ten households in Kampala lives below the poverty line (World Bank Group, 2016). School dropout rates still remain high (Liang, 2002; MoES, 2012). Aversive disciplinary measures are still being practiced in most schools (Thumann, Nur, Naker, & Devries, 2016). Mental health services in schools in Uganda are inadequate and non-existent in many schools (Kigozi et al., 2010). Knowledge of the prevalence of mental health problems in schools may stimulate policy development for school mental health. This study may contribute to knowledge about mental health problems among adolescents in schools in Uganda, an under-researched area. It may also stimulate more research into determinant of mental health and groundwork for interventions among school children. If we are to address

poverty, it's important that we ensure there is good mental health in the entire population (Funk, Drew, & Knapp, 2012).

### 1.3 Aim

This study investigated the prevalence of symptoms of depression, anxiety and somatic syndromes among secondary school students in Kampala and examined the association of these conditions with socio-demographic factors (i.e. age, gender, family composition)

### 1.4 Objectives

- To examine the prevalence of symptoms of depression, anxiety and somatic syndromes among secondary school students in Kampala.
- To determine the co-morbidity of symptoms of depression, anxiety and somatic syndromes among secondary school students in Kampala.
- To determine the association between socio-demographic factors (age, gender, family composition) and symptoms of depression among secondary school students in Kampala.
- To determine the association between socio-demographic factors (age, gender, family composition) and symptoms of anxiety among secondary school students in Kampala.
- To determine the association between socio-demographic factors (age, gender, family composition) and symptoms of somatic syndromes among secondary school students in Kampala.

# Chapter 2

# Literature Review

## 2.1 Introduction

This study aims at examining the prevalence of symptoms of depression, anxiety and somatic complaints and also examine the influence of demographic variables on the distribution of these conditions. In this section, I review previous literature on prevalence of depression, anxiety and somatic syndromes. I also review literature on the influence of gender, age and family composition as defined by living arrangement and family size on the distribution of depression, anxiety or somatic syndromes. This review will inform analysis of our findings.

## 2.2 Prevalence of Depression

Prevalence estimates for depression in children and adolescents vary depending on population (e.g., school populations or community), period considered (e.g. last three months, lifetime), informant (parent or child) or criteria used for diagnosis (DSM/ICD based interview or screening tools). Thapar, Collishaw, Pine, and Thapar (2012) reviewed studies that used diagnostic interviews to document prevalence of depression among adolescents in the United States, Britain and New Zealand. Five population based studies across these countries reported prevalences for current depression ranging from 0.4 to 16.8% and lifetime prevelance of depression ranging from 1.1 to 23.4%. Studies that have used screening tools report higher rates than studies that have used diagnostic interviews. For example, prevalence rates of depression ranging from 23% to 62.7% have been reported in studies that used self-report screening measures (Nagendra, Sanjay, Gouli, Kalappanavar, & Kumar, 2012; Nguyen, Dedding, Pham, Wright, & Bunders, 2013; Safiri, Khanjani, Kusha, Narimani, &

Karamzad, 2013; Wang, et al., 2016). This is because diagnostic interviews follow a strict criterion (DSM/ICD) that also takes into account distress and functional impairment. Yet screening tools only focus on a collection of symptoms regardless of distress or impairment and they do not allow for the assessor to exercise clinical judgement on reported symptoms. Screening tools use arbitrary cut-off points which often differ from study to study (Desouky, Ibrahem & Omar, 2015; Ekundayo et al., 2007; Nagendra et al., 2012; Safri et al., 2013.

Studies among adolescents have reported prevalences for lifetime major depression ranging between 11% and 23%, whereas the prevalence for current major depression ranged between 7.5% and 9.4% (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Kinyanda, et al., 2013; Sund, Larsson, & Wichstrøm, 2011). Studies done in Uganda found between 8.6% and 21% of adolescents and children reported symptoms of a depressive disorder (Kinyanda et al., 2013; Nalugya-Sserunjogi, et al., 2016).

Carrellas, Biederman, & Uchida, (2017) have expressed the importance of sub-threshold manifestations of depression among adolescents. In a systematic review they noted that prevalence for subthreshold major depressive disorder ranged between 5.3% in the past year to 29.2% in the two weeks prior to screening. Across most studies reviewed, subthreshold major depressive disorder was defined as presence of depressive symptoms but do not meet full DSM IV criteria (Carrellas, Biederman, & Uchida, 2017). They further noted that much as the DSM IV criteria was not met, symptoms were asscoaited with serious morbidity (Carrellas, Biederman, & Uchida, 2017).

### 2.3 Prevalence of Anxiety disorders

In a review of large epidemiological studies, Costello, Egger, and Angold (2005), reported three month prevalence estimates of anxiety among school aged children and adolescents ranged from 2.2% to 8.6%. Six month estimates ranged between 5.5% and

17.7%, whereas 12 months prevalence rates ranged from 8.6% to 20.9%. Furthermore, lifetime prevalence of anxiety ranged from 8.3% to 27% (Costello et al., 2005). Recent studies have shown higher estimates. For example, a United States epidemiological survey found that 32.4% of 13-17 year olds experienced symptoms of anxiety in their lifetime (Kessler et al., 2012). Another American study among adolescents found prevalence of 31.9% for any anxiety disorder (Merikangas et al., 2010). Similarly, a large community study carried out in four districts in northern Uganda among 3-19 year olds found anxiety disorders in 26.6% of the sample (Abbo et al., 2013). Few studies have documented prevalence of anxiety among adolescent within psychiatric care. Esbjørn, Hoeyer, Dyrborg, Leth, and Kendall (2010) found anxiety in 5.7% of children and adolescents within psychiatric care in Denmark between 2004 to 2007. Compared to community surveys, this figure is low but this could be explained by methodological differences. Most surveys have been conducted by lay people with the help of an inteview schedule but in clinical studies-assessment is done by clinicians with intense scrutiny and clinical judgement.

The above studies have examined children and adolescents from community settings. Studies that have estimated prevalence of anxiety among school children report prevalence from 8.4 to 85% (Zarafshan, Mohammadi, & Salmanian, 2015). Adewuya, Ola, and Adewumi, (2007) found a 12 month prevalence of DSM-IV anxiety disorders in 15% of Nigerian secondary school adoelscents aged 13-18 years.

### 2.4 Prevalence of Somatic Complaints

Somatic syndromes are physical symptoms which cannot be fully explained by underlying pathology (Janssens, 2011). Terms such as functional somatic symptoms, somatoform symptoms, medically unexplained symptoms, psychosomatic symptoms, and subjective health complaints have been used to describe somatic syndromes (Janssens, 2011).

Some of the commonly observed symptoms of somatic syndromes include body-aches, headaches, nausea, eye problems, skin problems, stomach pains and vomiting.

Somatic syndromes are common among children or adolescents who find it difficult to express their feelings and emotions through language (Fiertag, Taylor, Tareen, & Garralda, 2012). Somatic syndromes have been linked to significant reduction in quality of life, impaired daily functioning and increased health care visits (Edwards, Stern, & Kasney, 2010).

The prevalence of somatic syndromes among children and adolescents ranged from 0.3% to 19% for recurrent abdominal pains (Chitkara, Rawat, & Talley, 2005) to as high as 89.5% for a headache in past 6 months (King, et al., 2011; Nyame, et al., 2010). Most somatic syndromes among children and adolescents are associated with headaches, abdominal pain, back pain and musculoskeletal pain (King et al., 2011). Hoftun and collegues (2011) found that 44.4% of the adolescents experienced bodily pain atleast once a week. Among school populations, Fischer, Gaab, Ehlert, and Nater, (2013) found that functional somatic symptoms were prevalent in 9.5% of the students.

**2.5 Co morbid conditions associated with Depression**

Comorbidity refers to the presence of two or more distinct, co-occurring disorders in one person simultaneously (Klein & Riso cited in Cummings, Caporino, & Kendall, 2014). Depression is highly comorbid with other mental disorders. Avenevoli et al (2015) reported that 63.7% of adolescents with 12 months major depressive disorders had another mental disorder. Anxiety disorders were found to be strongly associated with major depressive disorders. In their sample, those with an anxiety disorder had up to four fold increased risk (OR=3.96) of having a major depressive disorder and six times more likely to have severe major depressive disorder (Garber & Weersing, 2010). Adolescents with primary depressive

disorders tend to have comorbid anxiety more often than do those with primary anxiety disorders have comorbid depression (Garber & Weersing, 2010). A similar observation can be drawn from studies carried out in Uganda. For example a study done in central Uganda reported that 30% of those who reported depressive symptom also had social phobia, 28% had a panic disorder with or without agoraphobia, and 26% had a specific phobia (Nalugya-Sserunjogi, et al., 2016).

**2.6 Comorbid conditions associated with Anxiety Disorders**

Research has shown high comorbidity among anxiety disorders. Esbjørn et al, (2010) reported that about 2.8% of children and adolescents with anxiety had another comorbid anxiety disorder. Anxiety is highly comorbid with other disorders, especially depression. Lamers and colleagues (2011) analysed data from a cohort on depression and anxiety in the Netherlands, and found that of all people identified with a current anxiety disorder, 63% had a current and 81% had a lifetime depressive disorder. Similarly of all people identified with current depression 67% had a current and 75% had a lifetime comorbid anxiety disorder. These findings suggest high comorbidity between depression and anxiety disorders. Furthemore, they observed that in 57% of the comorbidity cases, anxiety preceded the depression whereas in only 18% depression preceded anxiety (Lamers, et al., 2011). Many studies published elsewhere also reported high anxiety-depresion comorbidity (Burstein et al., 2012; Moffitt et al., 2007), Adolescents diagnosed with social phobia were 1.67 time more likely to be diagnosed with depression (Burstein et al., 2011).

Although some studies suggest that cormorbidity of anxiety with depression is a rare occurrence, there is sufficient evidence justifying high comorbidity of anxiety with depression and thus it is believed both conditions share common factors- negative affectivity (Cummings, Caporino, & Kendall, 2014), symptom overlap and shared familial risks (Garber & Weersing, 2010).

## 2.7 Comorbid conditions associated with Somatic Syndromes

Somatic syndromes are highly comorbid with psychiatric conditions. Li et al., (2009) followed up and reviewed medical records of 1068 medical patients referred for consultation-liaison psychiatry services and made follow up interviews with those diagnosed with somatoform disorders. They observed that 9.5% presented with medically unexplained symptoms as their chief complaints and of these they noted a high degree of psychiatric comorbidity (96.1% had a psychiatric condition) and about four in ten people (35.6%) with medically unexplained symptoms had depression and three in ten had an anxiety disorder.

Anxiety disorders are more commonly found among children with somatic syndromes. Children and adolescent with functional abdominal pains are more likely to suffer anxiety (OR=4.59 for lifetime anxiety, and OR=3.57 for current anxiety) and depression (OR=2.62 for lifetime, OR=1.98 for current depression) as compared to those without abdominal pains (Shelby et al., 2013).

Many young people with somatic syndromes are able to draw a link between their somatic pains and their depressive mood. For example, a study that explored the experiences of young people with Chronic Fatigue Syndrome or Myalgic encephalomyelitis and depression reported that their low mood started after the CFS/ME and that restricted activity, difficulty interacting with their social environments accounted for the depression (Taylor, Loades, Brigden, Collin, & Crawley, 2016).

## 2.8 Socio-demographic factors

In this section I review literature on associations between symptoms of depression, anxiety and somatic syndromes with gender and age. I also review literature on associations between symptoms of depression, anxiety and somatic syndromes with family compositions (defined by living arrangement and number of siblings). Past literature has tried to explain

aetiology of these conditions from functional deficits within the family (Carr, 2016). It is important to understand if constitutional differences in family can also explain these conditions among adolescents.

### 2.8.1 Gender

More females than males suffer from depression (Avenevoli et al., 2015; Merikangas et al., 2010; Nalugya-Sserunjogi, et al., 2016; Nguyen et al., 2013; Sund et al., 2011). For example, Avenevoli et al., (2015) found that females are significantly more likely (OR=2.48) to have depression compared to males and also significantly more likely (OR=3.59) to have severe depression compared to males. A study caaried out in Uganda (Nalugya-Sserunjogi, et al., 2016), also found that females are at higher risk as compared to males but the odds were lower than that observed elsewhere (Avenevoli et al., 2015). On the other hand, there are studies that have found no significant difference in depression across gender (Ekundayo et al., 2007; Kinyanda et al., 2013; Safiri et al., 2013). This could probably be due to a sample with mixed age groups (e.g Kinyanda et al., 2013). Sex differences in depression are more significant during adolescence as compared to childhood (Hankin, et al., 2016).

Females are somewhat more likely than males to report an anxiety disorder of some sort and the vulnerability increases with age (Beesdo, Knappe, & Pine,2009; Costello et al., 2005; Remes, Brayne, & Lafortune, 2014). Blanco and colleagues (2014), for example noted that being female is associated with increased risk for panic disorder (OR=2.1), Social anxiety (OR=1.4), Specific phobia (OR=2.1), generalized anxiety disorder (OR=2.1) and Posttraumatic stress disorder (OR=2.2). In some anxiety conditions like OCD, males are more vulnerable than females (Huang et al., 2014).

Somatic syndromes are more common among females than males. Females have a twofold risk of developing medically unexplained pain compared to males (Leiknes et al.,

2007) This pattern has been documented in systematic reviews (Chitkara et al., 2005), cross sectional studies (Hoftun, Romundstad, Zwart, & Rygg, 2011), prospective studies (Leiknes et al., 2007), and clinical studies (Li et al., 2009; Steinbrecher, Koerber, Frieser, & Hiller, 2011; Verhaak, Meijer, Visser, & Wolters, 2006).

Biological accounts for gender differences in affective problems such as anxiety, depression and somatic syndromes could lie in the physiological changes that come with development. For example, activation of hypothalamus-pituitary-gonadal axis during puberty leads to the production of hormones that can interfere with the functioning of the hypothalamus-pituitary- adrenal axis and in turn contribute to depressive symptoms during adolescence (Klein & Romeo, 2013; Romeo, 2010; Whittle, et al., 2012). Hypothalamus-pituitary-gonadal related hormones have been noted to have more impact among females than males and thus account for gender differences in physiological reactivity in the face of psychosocial stresses (Ordaz & Luna, 2012; Zorumski, Paul, Izumi, Covey, & Mennerick, 2013).

### 2.8.2 Age

Vulnerability to depression increases with age (Avenevoli et al., 2015; Thapar et al., 2012; Wang, et al., 2016). This trend seems to reverse towards the end of adolescence. For example, from the national comorbidity survey for adolescents (United States) the risk for depression among 14 year olds, 15year olds, 16 year olds, 17 year olds and 18 year olds as compared to 13 year olds was 1.24, 1.94, 2.01, 2.36, and 1.87 times respectively (Avenevoli et al., 2015). A Similar trend has been observed by Wang, et al (2016) among adolescents in China. In their study they noted that as compared to 7-9 year olds, 13-15 year olds had 1.7 odds, and 16-17 year olds had 2.04 odds of having depression. However, studies conducted in Uganda seem to have a different observation as regards age, for example Nalugya-Sserunjogi, in a study of 13-16 year old students in central Uganda, compared adoelscents 14 years and

above with those below. No significant difference in depressive symptoms were observed (Nalugya-Sserunjogi, et al., 2016). In a study done by Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, (2013), among 3-19 year old children in a war-torn northern Uganda, the rate of depression increased with age. Participants under the age of 5 reported the lowest rate of depression (2.8%), followed by participants aged 6-9 years(5.8%), then participants aged 10-13 years (11.1%) and finally, participants aged 14-19 years reported the highest rate of depression (12.8%). Whilst a trend can be seen in this data, the results were not statistically significant (Kinyanda et al., 2013).

In terms of anxiety, research has failed to demonstrate a relationship between age (particularly adolescents aged 13 to 18 years) and the prevalence of anxiety disorders (Abbo et al., 2013; Merikangas et al., 2010). However, age differences have been noted in specific anxiety disorders. For example, in a national comorbidity survey for adolescents aged 13-18 years (United States), Burstein et al., (2011) observed that compared to 13-14 year olds, 15-16 year olds had 1.56 odds of having social anxiety. Whereas for 17-18 year olds the odds were 1.71 for having social anxiety in comparison with 13-14 year olds. Similar findings have been observed for obsessive compulsive disorders (Huang et al., 2014) and social anxiety (Polo, Alegría, Chen, & Blanco, 2011) among adult populations.

Finally, the risk of reporting somatic symptoms increases with age (Schulte & Petermann, 2011). In a systematic review to evaluate the suitability of somatic symptoms disorder category inclusion in the DSM 5, Schulte & Petermann (2011) noted that the risk of having somatic syndromes increased with age. For example in the Bremen Youth Study (Essau et al in Schulte & Petermann, 2011) nine percent of the 12-13 year old participants presented with a somatoform disorder. This was followed by 14% of 14-15 year olds and 18% of 16 to 17 year olds. .

### 2.8.3 Family composition- Number of siblings, living arrangement

Blanco and colleagues (2014) estimated that about 10% additional risk for depression results from dysfunctional family environments as compared to functional family environments. Dysfunctional family environment was defined by parental absence or separation from biological parents before the age of 18 years. Family dysfunctions are regarded as significant contributors to the origin of most mental health problems (Rutter, 2005). Many theorists, (such as Carr, 2016) employing contextual perspectives have elaborated on the association between family environment and mental illness. A cross sectional survey of 1290 adolescents, aged 13-19 years, found that adolescents not living with both parents were 1.5 times more likely to be depressed than those who resided with both parents (Maharaj et al., 2008). In a study conducted among school going adolescents in central Uganda, Nalugya-Sserunjogi observed that compared to adolescents coming from monogamous families, those from single parent families were two time more likely to have depressive symptoms (Nalugya-Sserunjogi, et al., 2016).

The role that family factors play in the development of anxiety remains uncertain. In a review of epidemiological studies, Rapee (2012) noted that most family variables (such as family size, composition, birth order, or living circumstance) were not consistently related to anxiety. However, Abbo and colleagues (2013) reported that children who were living with their father only and grandparent had 2.2 and 1.55 odds (respectively) of being diagnosed with an anxiety disorder compared to those living with both parents. The association between family variables and anxiety may be better explained by the quality of interaction than who constitutes the family. As regards the number of siblings, Abbo and colleagues (2013) found no association between number of children and anxiety disorder.

Literature cited above shows that anxiety and depressive symptoms are common among children and adolescents and very often these symptoms co-exist. Literature on the

prevalence of somatic syndromes varies greatly with type of complaint. Abdominal pains are highly comorbid with anxiety symptoms (Imran, Ani, Mahmood, Hassan, & Bhatti, 2014; King, et al., 2011). These conditions are more common among females than males (see Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Huang, et al., 2014). Although depression and somatic syndromes are noted to increase with age there is insufficient evidence that prevalence of anxiety varies with age. Family contextual factors like who constitutes family play a role in the development of anxiety, depression or somatic syndromes.

**2.9 Theoretical framework**

This study was guided by George Engel's biopsychosocial model (Engel, 1977). The model attributes disease to intricate variable interaction of biological factors (genetic, biochemical, etc), psychological factors (mood, cognitive, personality traits, and behaviour) and social factors (cultural, societal, and familial).

I conceptualised that the aetiology of symptoms of depression anxiety and somatic syndromes is multi-faceted. Much as an individual may be born with genetic or neurophysiological vulnerabilities (Hasler, 2010; Steimer, 2002; Mayou & Farmer, 2002), exposure to adverse life experiences can provide a fertile ground for the development of mental health problems (Carr, 2016; Kroner-Herwig, Gassmann, van Gessel, & Vath, 2011). However the individual's psychological attributes may moderate the effects of exposure to adverse life events (Lewinsohn in Carr, 2016). In this study, the biopsychosocial model was used to guide in the analysis to better understand the independent influence of family composition, gender and age on symptoms of depression, anxiety and somatic syndromes.

A number of theories have been advanced to support this model. In this section I will try to elaborate on some theories that account for the link between biological, psychological

and social factors as regards the conditions under study (depression, anxiety and somatic syndromes).

### 2.9.1 Biological theories

Endocrine dysregulation theories

Depression has been linked to amine dysregulation. In this link, three main monoamine neurotransmitters have been implicated namely, dopamine, norepinephrine, and serotonin (Cowen & Browning, 2015; Nutt, 2008). Depression is attributed to low activity of monoamine neurotransmitters in brain centres associated with reward and punishment (Deakin 1989 cited in Carr, 2016). It is also linked to thyroxin levels. A drop in thyroxin levels results in a dysregulation of the hypothalamic-pituitary thyroid axis which in turn results in alterations in mood states (Hage & Azar, 2012).

Anxiety on the other hand has been associated with dysregulation of the adrenergic and nonadrenergic systems of the autonomic nervous systems (Carr, 2016). Considering the above dysregulations in mind, fluctuations in these neurotransmitters have also been linked to estrogen, a finding that may account for gender differences in affective problems (Wharton, Gleason, Olson, Carlsson, & Asthana, 2012). This effect has been evident in studies that looked at menopausal transition among females (Gordon, et al., 2015) but little is known about its effect during adolescence transitions.

### 2.9.2 Psychological theories

Many psychological theories have been developed to account for depression, anxiety and somatic syndromes. In this study we will focus on Beck's cognitive theory (Beck, 2011) as a unifying theory across the conditions under study. Beck argues that during stress situations information processing becomes distorted, our thinking becomes rigid, overgeneralised (Neenan & Dryden, 2004). As people encounter negative life event right

from childhood, schemas about life, themselves or others become increasingly cemented. At exposure to stressful events these schemas become activated and they determine how we are likely to think about the events (negative automatic thoughts) which keeps around emotional problems. Each emotional disorder has a specific cognitive content (Neenan & Dryden, 2004). For example in depression, schemas normally reflect a loss, whereas in anxiety they reflect endangerment

### 2.9.3 Social theories

Social factors implicated in the aetiology of depression, anxiety and somatic syndromes are better explained by the family systems theory. Depression may result when anomalies in the structure or functioning of the family deter the children from completing age-appropriate developmental tasks (Carr, 2016; Restifo & Bögels, 2009; Schleider & Weisz, 2016). Children growing up with disengaged or enmeshed parents or in families with overly rigid boundaries have higher risk for somatic symptoms (Carr, 2016). Whereas children growing up with anxious or fearful parent often get socialized to anxious-fearful tendencies (Schleider & Weisz, 2016).

# Chapter 3

# Methods

## 3.1 Introduction

This chapter gives an overview of the research design and a description of the methodologies used in the study. A brief description of the research design, study setting, sampling methods and sample size, procedures in executing the study, the instruments used and the analysis plan. It also describes the ethical issues that were put into consideration.

## 3.2 Research design

A cross sectional design was used to determine the prevalence of symptoms of anxiety, depression and somatic syndromes under study. This was the most suitable design as the study intended to investigate the symptoms of multiple syndromes at one point in time. It was also the best design to fit the limited resources available.

## 3.3 Study setting

The study was conducted in Kampala district. Kampala is the capital city of Uganda. The District is divided into five administrative divisions: Kampala Central Division, Kawempe Division, Nakawa Division, Makindye Division, and Rubaga Division. The estimated population is 1.51 million people (Uganda Bureau of Statistics, 2014). Schools in Kampala are either government funded, faith-based or private. School grounds are generally small and accommodate large numbers of students. At least 88.7% of secondary school students have reported adequate sitting and writing space (Ministry of Education and sports, 2011). The student to teacher ratio in 2011 was reported to be 26:1 (Ministry of Education and sports, 2011) and English is medium of instruction. Enrolment is high in urban schools because students in urban schools have more access to resources (experienced teachers,

textbooks, internet, and laboratories) that can enable a student to pass national exams than rural schools (Liang, 2002).

### 3.4 Sampling

The sample consisted of secondary school students aged 14-17 years in Kampala. A multistage stratified random sampling method was used to select study respondents. Simple random sampling was used to select two of the five divisions in Kampala. The divisions selected included Lubaga division and Makindye division. Six schools were randomly (Blaikie, 2009) selected from a list of all school from the two divisions. Data was collected from the following schools; St Peters Nsambya secondary school, Lubaga secondary school, St Marys High school, Golden secondary school Kampala, Bunga Mixed secondary school and Eagle's nest secondary school. Given that the average age at which students join secondary school is 13 years, the age of participants range from 14 to 17 years. In most schools, the grades consisted of less than one hundred student. All students in the chosen grade were invited to participate in the study. Learners were allowed to participate once relevant consent and assent was received.

Sample size was determined A priori, using G-Power software (Faul, Erdfelder, Buchner, & Lang, 2009). The researcher assumed a small effect size (0.05) at a 95% level of power to test the effect of three predictor variables. With these factored into the formula, a minimum sample size needed for the study was 348. Taking into account non responses, this sample size was multiplied by a design effect of 1.8. The total sample size for the study was 626 participants.

### 3.5 Procedure

During the initial visit to the school an introductory letter seeking permission to conduct the research at the school (please refer to appendix A) and a clearance letter from

Kampala Capital City Authority (KCCA) Education department were handed to heads of the selected schools (please refer to appendix B). In these meetings, Head teachers were briefed about the study aims and were invited to ask questions about the study. It also enabled the researcher to learn more about the adolescents and the school operations in order to better plan for data collection. After permission was sought and granted, one teacher was assigned to assist in data collection. The teacher randomly selected a class or stream and mobilized the adolescents willing to participate in the study. The researcher met with students at the various schools at a time and venue that was approved by the school heads. The researcher introduced the study to the adolescents and invited those who wished to participate to collect parental consent forms (please refer to appendix C) and assent forms (please refer to Appendix D). Adolescents who were residing in boarding section and were willing to participate, had their parents contacted by phone to issue consent, whereas those who resided in their homes, carried consent forms to their parents.

Parents or guardians of adolescents at boarding school were contacted by text message or telephone calls. The message briefly stated the study aim and sought their consent for participation of the adolescent. A copy of the introduction letter was put on the class notice board. Adolescents and parents were given two days to consider if they were willing to participate in the study. Only adolescents whose parents had consented and they too had accepted to participate were recruited.

Data collection took place at schools, at an agreed upon time and venue. All consented and assented adolescents were given questionnaires (English version) to complete (please refer to Appendix E). The English version was used because English is the medium of instruction in schools in Kampala. Data collection was supervised by the researcher with help of two assistants. This entailed checking whether the respondent had answered all questions

and defining terms that are not well understood by respondents. All questionnaires were kept by the researcher in a secure, locked cupboard.

The questionnaires were coded and entered into a data analysis software (Statistical Product and Service Solutions version 23 (SPSS v23) (IBM Corp., Released 2014)) for analysis. A backup data file was emailed to the supervisor and also uploaded to Google drive.

## 3.6 Instruments

An instrument battery consisting of a socio-demographic questionnaire and measures of symptoms of depression, anxiety and somatic syndromes was administered to participants.

### 3.6.1 Socio-demographic questionnaire.

The socio-demographics questionnaire was used to obtain the respondents' age, gender, and current class (grade) of study, orphan status, number of siblings, and home living arrangement. Please refer to Appendix E for the socio-demographic measure.

### 3.6.2 Measures of symptoms of depression, anxiety and somatic syndromes.

The Youth Self-Report (YSR) is a widely used child-report measure that assesses problem behaviours along two dimensions, namely internalising and externalising behaviour problems. The YSR scores eight empirically based syndromes and DSM-oriented scales, and provides a summary of Total Problems. The measure assesses "Total Competency," which is a scale comprised of competency in activities, social functioning, and school performance (Achenbach & Rescorla, 2001).

In this study, three of the six DSM-oriented scales were used. These included the affective problems scale, anxiety problems scale and the somatic syndromes scale. Items are rated on a Likert scale with 0 = not at all, 1 =somewhat/sometimes true and 2= very

true/often true. The affective problems scale was used to measure symptoms of depression. This scale consists of 13 items that assess for symptoms such as sadness, crying, feeling tired, lack of interest in things, guilty feelings, worthlessness, self-harm, and loss of appetite, sleep problems, lack of energy, suicide talks, and changes in sleeping patterns, etc. The anxiety scale has six items assessing symptoms of anxiety such as fears, dependency, nervousness, worries, fear of school, and being fearful. The somatic syndromes scale has seven items assessing recurrent pains such as general aches, headaches, nausea, eye problems, skin problems, stomach and vomiting.

A total raw score for each scale was derived by summing all scores on items. Raw scores were converted to t-scores (Achenbach & Rescorla, 2001). A T-score below 65 will considered normal, those who score in the range of T65-T69, are considered to be on borderline, whereas those who score 70 and above are in a clinical range.

The YSR has demonstrated satisfactory psychometric properties. Its internal consistency measured with Cronbach's alpha coefficients ranges between 0.71 and 0.93 in a sample of 147 adolescents (Ferdinand, 2007). It is a valid measure for both externalising and internalising behaviour problems in youth. In a study that examined the factor structure, scale reliability and concurrent validity of the youth self-report among adolescents (11-14 years), reported Cronbach's alpha values of .89 equally for internalizing behaviour scale and externalizing behaviour scale (Ebesutani, Bernstein, Martinez, Chorpita, & Weisz, 2011). It has been widely used in studies (Achenbach & Rescorla, 2001). Two studies with formerly abducted adolescents and former child soldiers from northern Uganda have reported Cronbach's alpha coefficients ranging between 0.60 and 0.95 (Amone-P'Olak, Garnefski, & Kraaij, 2007; Klasen, Oettingen, Daniels, & Adam, 2010). License to use the YSR was obtained (refer to Appendix F). In this study, the Cronbach's alpha coefficient for the affective problems scale was 0.76, anxiety problems scale 0.53 and somatic syndromes scale

0.75. This was slightly below what was reported a validation study by Ebesutani., et al (2011) on DSM oriented affective problems scale (.79) and somatic problems scale (.76) but far below alpha coefficients reported for anxiety problem scale (.70).

### 3.7 Data analysis

Data was analysed using the SPSS version 23 (IBM Corp., Released 2014). All questionnaires were entered into SPSS. Following the YSR scoring guide (Achenbach & Rescorla, 2001), depression, anxiety and somatic syndromes scores were computed. The computed raw scores were tested for normality using Kolmogorov-Smirnov and Shapiro-Wilk tests. Shapiro-Wilk test showed that all distributions of raw scores (depression, anxiety and somatic syndromes) were significantly different from a normal distribution. This necessitated the use of nonparametric statistics. The raw scores were transformed into t-scores, using different guides for boys and girls. This was done in order to determine the cut-offs. All those who scored at or above t-score 70 were in the clinical range and thus were considered as having significant symptoms of the condition. Descriptive statistics were calculated for socio-demographic variables, symptoms of depression, anxiety and somatic problems. The prevalence was estimated with exact 95% binomial confidence limits, by gender, and overall. Bivariate analysis-Mann-Whitney U and Kruskal-Wallis H tests were used to determine associations. Binary logistic regressions were used to determine the effect of socio-demographic variables (age, gender, class, orphan-status, number of siblings and home living situation) on the mental health conditions under study. It was also used to determine the odds of getting symptoms of depression, anxiety or somatic complaints based on socio-demographic characteristics (Meltzer, Gatward, Goodman, & Ford, 2000)..

## 3.8 Ethical considerations

### 3.8.1 Clearance at Research Ethics Committees

Ethical clearance was obtained from Stellenbosch University Health Research Ethics committee (please see appendix G) and Uganda National Council of Science and Technology (UNCST) (please see appendix H). Permission was sought from heads of the schools selected for data collection.

### 3.8.2 Risks, Burdens, and Benefits

During the time of seeking permission from the school heads, an introductory letter was given to the school heads, explaining the objectives of the study, how data collection would be carried out, the potential risks (emotional breakdown due to sensitive material in the questionnaire) and how this would be managed. A referral system for counselling or psychiatric care was put in place in case of emotional breakdown. A child and adolescent clinical psychologists from a nearby government hospital (Butabika Hospital) was arranged to receive referrals. Adolescents were informed that services in a government hospital are free of charge, and if any of the participants needs to see a psychologist, the research team will work with the school administration to help them access a mental health professional.

In the research brief to adolescents and assent and consent forms parents and adolescents were informed that there are no direct benefits from participating in the study but their participation will help in generating for policy and services development. They were told that the research team is independent of the school and that their participation yields no course credits. Adolescents were informed that they are free to terminate their participation or withdraw from the study at any time they want to without any negative consequences. Data collection took place at a time when most schools had completed class work and were in revision for end of term exams. The day and time for data collection was collaboratively set by the adolescents and the research team. This took into consideration the time of obtaining

parents' consent. The research team distributed consents to only those who wanted to participate to take to their parents. An information leaf about the study was pinned to the notice board.

### 3.8.3 Vulnerable groups and individuals

Since the study subjects were minors, consent was sought from parents or guardians. Consent was also be sought from the adolescent. In the consent, they were told about the freedom to participate or not to. Adolescents who wanted to withdraw from the study-were allowed to.

### 3.8.4 Privacy and Confidentiality

The research team maintained confidentiality throughout the study. During data collection the teachers were accused and adolescents were reminded of confidentiality. To ensure anonymity, adolescents participating in the study were told not to include their names on the study tools. Questionnaires were kept in a safe place only accessible to the principal investigator. The data set was stored on a password protected computer and only the principal investigator had access to the data

# Chapter 4

# Results

## 4.1 Participants

Questionnaires were administered to 661 respondents. 68 respondents withdrew from the study, 10 were eliminated due to random responses (i.e. they ticked all or only extreme responses) and 34 were eliminated due to participants being above the age of 17 years. A total of 549 completed questionnaires were considered for analysis. Table 1 contains the demographic details of participants. In this study, the age of participants ranged from 14 to 17 years (*M* = 15.6; SD=1.02). Age was positively skewed. Focusing on the different age groups, the majority (n=179; 32.6%) were 16 years old, followed by 15 year olds (n=145; 26.4%). Seventeen year olds constituted 23.7% (n=130) and the 14 year olds were 17.3% (n=95). Majority of the study participants were drawn from grade 10 (n=237; 43.3%), 29.1% were drawn from grade 9 (n=159) and 25.6% were from grade 11(n=140). Only 2% were from grade 12(n=11).

The average number of children below 18 years in the family was 3.49 (SD=2.39) children. Similarly the average number of adults in the family was 3 people. The majority of participants were female (n=317; 58.2%). In terms of religion, most participants regarded themselves to be Catholic (n=202; 37.1%), followed by Protestant (n=133; 24.4%), Muslim (n=74; 13.6%), Pentecostal Christian (n=63; 11.6 %) and finally Seventh Day Adventists (n=9; 1.7%). Sixty three (11.6%) of the respondents belonged to some other denomination other than the above.

Participants reported a number a living arrangements. Most of the participants reported living with both parents (n=281; 51.7%), whereas 20.4% (n=111) reported living

with only their mothers and 7% (n=38) reported living with only their father. A few participants reported living with grandparents (n=32; 5.9%), relatives (n= 73; 13.4%) and friends (n=9; 1.7%).

Participants reported the education level of their parents. Most of the participants reported that their fathers had reached tertiary or university level (n=280; 56%), whereas 16.6% (n=83) reported that their fathers had reached A-level and 15% (n=75) of the participants reported that their fathers had reached O-level. Only 9.4% (n=47) reported that their fathers completed schooling at primary level and 3% (n=15) reported that their fathers had never gone to school.

As regards the mothers' education level, still the majority (n=230; 44.5%) reported that their mothers had ascended up to tertiary or university level. Then 16.6% (n=86) reported that their mothers had reached A-level and 22.8% (n=118) reported that their mothers had attained only O-level education, whereas 12% (n=62) reported that their mother had only reached primary level and 4.1% (n=21) reported that their mothers had never gone to school.

Table 1

*Socio-demographic characteristics of study participants*

| Variable | N | % | 95% Confidence Interval Lower | 95% Confidence Interval Upper |
|---|---|---|---|---|
| Gender | | | | |
| Male | 228 | 41.8 | 37.5 | 46.0 |
| Female | 317 | 58.2 | 54.0 | 62.5 |
| Religion | | | | |
| Catholic | 202 | 37.1 | 30.5 | 40.5 |
| Protestant | 133 | 24.4 | 21.9 | 31.6 |
| Moslem | 74 | 13.6 | 12.0 | 19.1 |
| Seventh Day Adventist | 9 | 1.7 | 0.6 | 3.7 |
| Pentecostal Christian | 63 | 11.6 | 7.1 | 13.7 |
| Other | 63 | 11.6 | 7.1 | 13.7 |
| Education of father | | | | |
| Never been to school | 15 | 3.0 | 1.7 | 5.4 |
| Primary level | 47 | 9.4 | 6.6 | 12.8 |
| O-level | 75 | 15.0 | 12.3 | 19.7 |
| A-level | 83 | 16.6 | 11.7 | 19.1 |
| Tertiary/University level | 280 | 56.0 | 50.7 | 61.4 |
| Education of mother | | | | |
| Never been to school | 21 | 4.1 | 2.6 | 6.8 |
| Primary level | 62 | 12.0 | 10.0 | 17.4 |
| O-level | 118 | 22.8 | 17.4 | 26.2 |
| A-level | 86 | 16.6 | 12.0 | 19.4 |
| Tertiary/University level | 230 | 44.5 | 38.7 | 49.6 |
| Living arrangement | | | | |
| With both parents | 281 | 51.7 | 47.6 | 56.3 |
| Father only | 38 | 7.0 | 4.8 | 9.0 |
| Mother only | 111 | 20.4 | 16.9 | 23.9 |
| Grand parent | 32 | 5.9 | 4.0 | 7.9 |
| Relatives | 73 | 13.4 | 10.5 | 16.4 |
| Friends | 9 | 1.7 | 0.7 | 2.9 |
| Age | | | | |
| 14 | 95 | 17.3 | 14.3 | 20.4 |
| 15 | 145 | 26.4 | 22.6 | 30.1 |
| 16 | 179 | 32.6 | 29.2 | 36.9 |
| 17 | 130 | 23.7 | 20.0 | 27.0 |
| Class | | | | |
| Grade 9 | 159 | 29.1 | 25.2 | 32.9 |
| Grade10 | 237 | 43.3 | 39.3 | 47.5 |
| Grage11 | 140 | 25.6 | 21.8 | 29.2 |

| | | | | |
|---|---|---|---|---|
| Grade12 | 11 | 2.0 | 0.9 | 3.3 |
| | M(SD) | | RANGE | |
| Number of children below 18yrs | 3.52(2.39) | | 1-19 | |
| Number of adults | 3.29(2.14) | | 0-20 | |

**4.2 Prevalence of symptoms of depression, anxiety and somatic syndromes**

*Prevalence of symptoms of depression.* Table 2 contains prevalence of symptoms of depression, anxiety and somatic syndromes. In the sample 115 participants (21.1%) reported symptoms of depression that above the clinical threshold. These elevated symptoms of depression were more prevalent among female participants (n=85; 26.8%) than males (n=30; 13.2%).

*Prevalence of symptoms of anxiety.* The prevalence of anxiety symptoms was 38.5% (n=210) in the study sample. Similarly with anxiety, symptoms of anxiety were more common among females (n=132; 41.6%) than males (n=78; 34.2%).

*Prevalence of somatic syndromes.* Somatic syndromes were found in 42% (n=229) of the sample. Somatic syndromes were more prevalent among females (n=168; 53%) than males (n=61; 26.8%).

Table 2

*Prevalence of symptoms of depression, anxiety and somatic syndromes by gender*

| Symptoms | Total **(n=545)** | | 95% CI | | Males **(n=228)** | | 95% CI | | Females **(n=317)** | | 95% CI | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | Lower | Upper | N | % | Lower | Upper | N | % | Lower | Upper |
| Depression (>cut-off) | 115 | 21.1 | 17.8 | 24.6 | 30 | 13.2 | 8.9 | 18.1 | 85 | 26.8 | 22.2 | 31.8 |
| Anxiety (>cut-off) | 210 | 38.5 | 34.9 | 42.6 | 78 | 34.2 | 28.3 | 40.6 | 132 | 41.6 | 36.4 | 47.2 |
| Somatic Syndromes (>cut-off) | 229 | 42.0 | 37.8 | 45.9 | 61 | 26.8 | 21.2 | 32.3 | 168 | 53.0 | 47.5 | 58.8 |

### 4.3 Co-morbidity

Table 3

*Participants scoring above cut-off on symptoms of more than one condition*

| Comorbidities | N | % | 95% Confidence Interval | |
|---|---|---|---|---|
| | | | Lower | Upper |
| No symptoms | 224 | 41.1 | 37.1 | 45.1 |
| Symptoms of one disorder | 150 | 27.5 | 23.9 | 31.6 |
| Symptoms of two disorders | 109 | 20.0 | 16.9 | 23.7 |
| Symptoms of three disorders | 62 | 11.4 | 8.8 | 14.3 |

Table 3 shows the frequency of participants scoring above cut-off on symptoms of more than one condition. Only 11.4% (n=62) scored above cut-off on symptoms of all the three conditions, 20% (n=109) scored above cut-off on symptoms of two of the three condition under study and 27.5% (n=150) met cut-off for symptoms of only one condition. A substantial number (n=224; 41.1%) did not meet cut-off on any of the conditions.

Table 4

*Prevalence of Comorbidities of symptoms of Depression, Anxiety and Somatic syndromes*

| **Primary condition** | **Comorbidity** | **Level** | **N (%)** |
|---|---|---|---|
| Anxiety(n=210) | Depression | No | 131(62.4) |
| | | Yes | 79(37.6) |
| | Somatic syndromes | No | 84(40) |
| | | Yes | 126(60.0) |
| Depression(n=115) | Anxiety | No | 36(31.3) |
| | | Yes | 79(68.7) |
| | Somatic syndromes | No | 25(21.7) |
| | | Yes | 90(78.3) |
| Somatic syndromes | Depression | No | 139(60.7) |
| (n=229) | | Yes | 90(39.3) |
| | Anxiety | No | 103(45) |
| | | Yes | 126(55) |

Table 4 contains prevalence of comorbidities among symptoms of depression, anxiety and somatic syndromes. In the study sample, 37.6% (n=79) of those who scored above cut-off on symptoms of anxiety also scored above cut-off on symptoms of depression. Of those with significant symptoms of anxiety, 60% (n=126) of them had comorbid symptoms of somatic syndromes. Of the 115 participants with symptoms of depression, 68.7% (n=79) had comorbid symptoms of anxiety and 78.3% (n=90) had comorbid symptoms of somatic syndromes. In the study sample, 39.3 % (n=90) of those who scored above cut off on somatic syndromes also had comorbid symptoms of depression and 55% (n=126) also had comorbid symptoms of anxiety.

**4.4 Associations between socio-demographic factors and symptoms of depression, Anxiety and Somatic syndromes**.

Table 5 shows associations between socio-demographic variables and symptoms of depression, anxiety and somatic syndromes. In this study, gender was significantly associated with symptoms of depression, anxiety and somatic syndromes.

*Association between gender and symptoms of depression, anxiety, and somatic syndromes*.

A Mann-Whitney test indicated that there was significantly more symptoms of depression among females ($M$=6.09; $SD$=±4.09) than males ($M$=3.81; $SD$=±3.36), $U$ = 23618, $p$ < .001, $r$ =.29. There were significantly more symptoms of anxiety among females ($M$=5.15; $SD$=±2.44) than males with anxiety symptoms ($M$=3.75; $SD$=±2.29), $U$=24219, $p$ < .001, $r$ = .28. Mann-Whitney U test also showed a significant association between somatic syndromes and gender with females ($M$=4.91; $SD$=±2.98) scoring higher than males ($M$=3.06; $SD$=±2.52) on somatic syndromes, $U$=22981, $p$ < .001, $r$ =.31.

*Association between age and symptoms of depression, anxiety and somatic syndromes.* Kruskal-Wallis H Test was conducted to compare the distributions across the age groups. No significant difference in symptoms of depression $H(3)$ =0.98, $p$ =.81, anxiety $H(3)$ =0.42, $p$ =.94 and somatic syndromes $H(3)$ =0.64, $p$ =.89, were found across age groups

*Associations between family composition and symptoms of depression, anxiety and somatic syndromes*. Family compositions was determined by living arrangement and family size as shown by the number of children in the home and number of adults in the home. Kruskal-Wallis H Test showed significant differences in distribution of symptoms of depression across living arrangements $H(5)$ =22.76, $p$ < .001. Adolescents who reported staying with friends scored highest on symptoms of depression ($M$=9.44; $SD$=4.90) as compared to adolescent from other living arrangements. Those who were living with grandparents

(*M*=6.38; *SD*=4.07) scored higher on symptoms of depression than those who were living with both parents (*M*=4.44; *SD*=3.63).

Adolescents living with friends also reported significantly more somatic syndromes than adolescent from other living arrangements (*M*=6.00; *SD*=3.32), *H*(5) =11.32, *p* =.045. Those living with both parents reported the least somatic syndromes (*M*=3.95; *SD*=2.87). As regards anxiety, there was no significant difference in symptoms of anxiety among adolescents staying with both parents (M=4.35; SD=2.54), those staying with a father only (*M*=4.18; *SD*=2.29), those staying with mother only (*M*=4.96; *SD*=2.57), those staying with a grandparent (*M*=4.81; *SD*=1.96), those staying with a relative (*M*=4.89; *SD*=2.35) or those staying with friends (*M*=5.22; *SD*=2.22), *H* (5) =8.816, *p* =.117.

*Association between number of children, number of adults in a home and symptoms of depression, anxiety and somatic syndromes.* Spearman rank correlations was conducted to determine the correlation between the number of children in the home with the scores on symptoms of depression, anxiety and somatic syndromes. There was no relationship between number of children below 18 years at home with scores on symptoms of depression ($r_s$(521)= -.001, *p* =.975), scores on symptoms of anxiety ($r_s$(522)= .007, *p* =.868) and somatic syndromes($r_s$(522)= .041, *p* =.354). Similarly there was no relationship between number of adults in the home and symptoms of depression ($r_s$(521)= -.028, *p* =.522), anxiety ($r_s$(522)= .004, *p* =.926), or somatic syndromes ($r_s$(522)= .057, *p* =.194).

*Association between education of parents and symptoms of depression, anxiety and somatic syndromes*. A Kruskal-Wallis H test was conducted to determine if education level of the father was associated with symptoms of depression, anxiety or somatic symptoms. There was no significant difference in symptoms of depression (*H*(4) =2.89, *p* =.576), anxiety (*H* (4) =1.81, *p* =.772) or somatic syndromes (*H*(4) =8.31, *p* =.081) across the fathers levels of

education. Similarly with education of the mother, there was no significant difference in symptoms of depression ($H(4) = 7.88$, $p = .096$), anxiety ($H(4) = 3.754$, $p = .440$) or somatic syndromes ($H(4) = 2.255$, $p = .689$) across the mothers' levels of education.

*Association between religion and symptoms of depression, anxiety or somatic syndromes.*

A Kruskal-Wallis H test was conducted to determine if symptoms of depression, anxiety or somatic syndromes were different across the six religious denominations. Seventh Day Adventist adolescents were significantly more depressed as compared to other denominations. Moslems had the least scores on symptoms of depression ($H(5) = 13.39$, $p = .020$). No significant difference in symptoms of anxiety ($H(5) = 8.16$, $p = .147$), or somatic syndromes ($H(5) = 3.53$, $p = .619$) was noted across the six religious denominations.

Table 5

*Associations between socio-demographic factors and symptoms of Depression, Anxiety and Somatic syndromes*

| | **Depression** | | **Anxiety** | | **Somatic syndromes** | |
|---|---|---|---|---|---|---|
| | M (±SD) | Statistic/p-value | M (±SD) | Statistic/p-value | M (±SD) | Statistic/p-value |
| **Gender** | | | | | | |
| Male | 3.81(±3.36) | *U*=23617.50 < .001 | 3.75(±2.29) | *U*=24218.50 < .001 | 3.06(±2.52) | *U*=22981.0 < .001 |
| Female | 6.09(±4.09) | | 5.15(±2.44) | | 4.91(±2.98) | |
| **Religion** | | | | | | |
| Pentecostal | 5.16(±3.82) | *H*(5)=13.39 .020, | 4.48(±2.18) | *H*(5)=8.164 .147 | 4.25(±2.91) | *H*(5)=3.529 .619 |
| Christian | | | | | | |
| Catholic | 5.21(±3.87) | | 4.71(±2.46) | | 4.14(±2.86) | |
| Protestant | 4.74(±3.90) | | 4.28(±2.56) | | 3.85(±2.77) | |
| Moslem | 4.32(±3.99) | | 4.28(±2.34) | | 4.16(±3.42) | |
| S D A | 7.11(±4.34) | | 5.78(±2.99) | | 4.22(±3.70) | |
| Other | 6.30(±4.21) | | 4.95(±2.62) | | 4.65(±3.07) | |
| **Education of father** | | | | | | |
| Tertiary/University level | 4.96(±3.85) | *H*(4)=2.892 .576 | 4.65(±2.51) | *H*(4)=1.805 .772 | 4.06(±2.92) | *H*(4)=8.307 .081 |
| A-level | 5.10(±3.96) | | 4.20(±2.47) | | 3.86(±2.93) | |
| O-level | 5.37(±4.48) | | 4.64(±2.55) | | 4.27(±3.24) | |
| Primary level | 5.55(±3.85) | | 4.60(±2.36) | | 5.15(±2.76) | |
| Not schooled | 6.00(±3.44) | | 4.53(±2.67) | | 3.73(±3.52) | |
| **Education of mother** | | | | | | |
| Tertiary/University level | 4.62(±3.62) | *H*(4)=7.882 .096 | 4.44(±2.51) | *H*(4)=3.754 .440 | 4.00(±2.92) | *H*(4)=2.255 .689 |

| | | | |
|---|---|---|---|
| A-level | 5.26(±3.74) | 4.45(±2.54) | 4.37(±3.24) |
| O-level | 5.25(±4.03) | 4.61(±2.58) | 4.14(±2.93) |
| Primary level | 5.90(±4.33) | 5.03(±2.29) | 4.60(±2.87) |
| Not schooled | 6.86(±5.19) | 4.76(±2.32) | 4.29(±3.18) |

Table 6

*Associations between socio-demographic factors and symptoms of Depression, Anxiety and Somatic syndromes*

| | **Depression** | | **Anxiety** | | **Somatic syndromes** | |
|---|---|---|---|---|---|---|
| | M (±SD) | Statistic/p-value | M (±SD) | Statistic/p-value | M (±SD) | Statistic/p-value |
| **Living arrangement** | | | | | | |
| With both parents | 4.44(±3.63) | *H*(5)=22.755 <.001 | 4.35(±2.54) | *H*(5)=8.816 .117 | 3.95(±2.87) | *H*(5)=11.324 .045 |
| Father only | 5.21(±4.05) | | 4.18(±2.29) | | 4.16(±2.47) | |
| Mother only | 5.74(±4.27) | | 4.96(±2.57) | | 4.76(±3.09) | |
| Grand parent | 6.38(±4.07) | | 4.81(±1.96) | | 4.50(±3.67) | |
| Relatives | 5.71(±3.90) | | 4.89(±2.35) | | 3.63(±2.79) | |
| Friends | 9.44(±4.90) | | 5.22(±2.22) | | 6.00(±3.32) | |
| **Age** | | | | | | |
| 14 | 5.38(±4.46) | *H*(3)=.986 .805 | 4.48(±2.58) | *H*(3)=.424 .935 | 4.37(±3.12) | *H*(3)=.644 .886 |
| 15 | 5.23(±3.88) | | 4.67(±2.46) | | 4.14(±2.89) | |
| 16 | 4.88(±3.86) | | 4.49(±2.40) | | 4.07(±2.87) | |
| 17 | 5.18(±3.80) | | 4.65(±2.52) | | 4.15(±3.06) | |
| Number of children below 18yrs | rho(523)=-.003, p=.946 | | rho(524)= .011, p=.803 | | rho(524)= .041, p=.347 | |
| Number of adults | rho(523)=-.028, p=.522 | | rho(524)= .004, p=.926 | | rho(524)= .057, p=.194 | |

Table 7

*Multiple Regression model for factors associated with symptoms of depression*

| Variable | Odds Ratio | (95% Confidence Intervals) | Likelihood ratio test *P*-value |
|---|---|---|---|
| **Gender** | | | |
| Male (Ref) | - | | - |
| Female | 2.35 | (1.450 – 3.816) | .001* |
| **Religion** | | | |
| Catholics (Ref) | - | | - |
| Protestants | .710 | (.387 – 1.304) | .270 |
| Moslems | .941 | (.467 – 1.899) | .866 |
| Seventh Day Adventists | 5.12 | (1.20 – 21.8) | .027* |
| Pentecostal Christians | .868 | (.413 – 1.825) | .708 |
| Other | 1.62 | (.825 – 3.182) | .161 |
| **Living arrangement** | | | |
| Both parents (Ref) | - | | - |
| Father only | 1.47 | (.593 – 3.640) | .406 |
| Mother only | 2.20 | (1.264 – 3.842) | .005* |
| Grandparents | 2.72 | (1.153 – 6.399) | .022* |
| Relatives | 1.91 | (1.006 – 3.634) | .048* |
| Friends | 12.42 | (2.851 – 54.13) | .001* |

*Note.* * Significant at 0.05

### 4.5 Logistic regression

Multiple logistic regression was performed to predict the effect of gender, living arrangement and religion on symptoms of depression. Omnibus test showed that the logistic regression model was statistically significant, $X^2(7) = 46.42$, $p < .001$. The model explained 13% (Nagelkerke $R^2$) of the variance in symptoms of depression and correctly classified 79.8% of the cases. Females (OR=2.35, 95%CI= 1.45 - 3.82) were more likely to have symptoms of depression as compared to male adolescents. As regards living arrangement, compared to adolescents staying with both parents, symptoms of depression are more in those staying with friends (OR=12.42, 95%CI= 2.85 - 54.13), the odds were also more for those staying with grandparents(OR=2.72, 95%CI= 1.15 - 6.4) and those staying with mother only (OR=2.20,

95%CI= 1.26 - 3.84), however those staying with relatives (OR=1.91, 95%CI= 1.01 - 3.63) were twice as likely to have depression symptoms as those with both parents.

With regards to religion, the vulnerability of developing symptoms of depression was significantly elevated among Seventh Day Adventist adolescents (OR=5.12, 95%CI= 1.20 - 21.81). Compared to Catholics, the vulnerability for developing symptoms of depression was reduced for Protestants, Muslims and Pentecostal Christians. However this relationship was not statistically significant. Adolescents from other religious denominations has an increased chance (OR=1.62, 95%CI= 0.83 - 3.18) of having symptoms of depression although this relationship too was not statistically significant.

Table 8

*Multiple regression for factors associated with symptoms of Anxiety*

| Variable | Odds Ratio | (95% Confidence Intervals) | Likelihood ratio test *P*-value |
|---|---|---|---|
| **Gender** | | | |
| Male (Ref) | - | | - |
| Female | 1.37 | (0.964 – 1.953) | .079 |

Table 8 shows a logistic regression to establish how much gender predicts symptoms of anxiety. The model was not statistically significant $X^2(7)$ =3.107.42, p = .078. This model explained 0.8% (Nagelkerke $R^2$) of the variance in symptoms of anxiety and correctly classified 61.5% of the cases. The model showed that females had 37% increased risk of developing anxiety as compared to males. However this relationship was not statistically significant. These result will be interpreted with caution as the reliability for the anxiety scale was noted to be low.

**Table 9**

*Multiple Regression for factors associated with Somatic syndromes*

| Variable | Odds Ratio | (95% Confidence Intervals) | Likelihood ratio test *P*-value |
|---|---|---|---|
| **Gender** | | | |
| Male (Ref) | - | | - |
| Female | 3.28 | (2.25 – 4.78) | .000* |
| **Living arrangement** | | | |
| Both parents (Ref) | - | | - |
| Father only | .617 | (.291 – 1.308) | .208 |
| Mother only | 1.31 | (.827 – 2.078) | .249 |
| Grandparents | .668 | (.300 – 1.488) | .323 |
| Relatives | .673 | (.387 – 1.171) | .161 |
| Friends | 5.496 | (1.07 – 28.3) | .042* |

Table 9 shows a logistic regression to determine the effect of gender and living arrangement on somatic symptoms. The model was statistically significant $X^2(6) = 51.22$, $p < .001$. The model explained 12.2% (Nagelkerke $R^2$) of the variance in somatic syndromes and correctly classified 65.7% of the cases. Gender was a significant predictor of somatic syndromes among adolescent. Females (OR=3.28, 95%CI= 2.25- 4.78) were more likely to have somatic syndromes as compared to males. Adolescent living with friends other than both parents had higher chances of developing somatic syndromes (OR=5.5, 95%CI= 1.07 - 28.32). Those living with only their father (OR=.62, 95%CI= 0.29 - 1.31), with grandparents (OR=.67, 95%CI= 0.30 - 1.49), and those living with relatives (OR=.67, 95%CI= 0.39 - 1.17) had a reduced risk of developing somatic syndromes compared to those living with both parents. Those staying with only their mothers had a 30% increased chance of getting somatic syndromes.

# Chapter 5

# Discussion

## 5.1 Introduction

This study investigated the prevalence of symptoms of depression, anxiety and somatic syndromes among secondary school adolescents in Kampala. It also examined the association between these symptoms and a selected socio-demographic variables (namely, age, gender, and family composition). In this chapter, I discuss the findings from this study in relation to previous literature.

## 5.2 Prevalence of symptoms of depression.

The first objective was to determine the prevalence of symptoms of depression, anxiety and somatic syndromes among secondary school students. In the present sample, 21.1% (95%CI 17.8-24.6) of adolescents had significant symptoms of depression. These findings were comparable to what has been observed in other studies carried out in Uganda (Nalugya-Sserunjogi, et al., 2016), Kenya (Khasakhala, Ndetei, Mutiso, Mbwayo, & Mathai, 2012) or elsewhere (Fatiregun & Kumapayi, 2014; Nguyen, Dedding, Pham, Wright, & Bunders, 2013; Wang, et al., 2015). The common denominator between these studies and the current study is that, self-report measures were used to collect data. These findings have also been reported in large studies from high income countries or low and middle income countries (Nguyen, Dedding, Pham, Wright, & Bunders, 2013; Khasakhala, Ndetei, Mutiso, Mbwayo, & Mathai, 2012). These findings are further supported by evidence from systematic reviews examining sub-threshold depression or symptoms of depression among children and adolescents (Carrellas, Biederman, & Uchida, 2017). This confirms the current finding that that two in every ten adolescents in secondary schools have significant depressive symptoms.

It is also worth noting that there are studies that reported prevalence rates higher than our current findings (El- Sayed Desouky, Abdellatif Ibrahem, & Salah Omar, 2015; Safiri, Khanjani, Kusha, Narimani, & Karamzad, 2013) and findings lower than what we found in this study (Ekundayo, et al., 2007). Prevalence rates are bound to vary if samples are drawn from different populations. For example, the rate of depressive symptoms were higher among Indian students (Nagendra, Sanjay, Gouli, Kalappanavar, & VinodKumar, 2012) as compared to our findings. These variations would as well be explained by methodological differences. For example, Ekundayo, et al., (2007) used the abbreviated BDI-II with the cutoff determined by the upper quartile score and found 14.7% of Jamaican students with significant symptoms of depression. El- Sayed Desouky, Abdellatif Ibrahem, & Salah Omar, (2015) used the 21 item BDI and a cutoff of 26 points.

Epidemiological studies that used rigorous diagnostic approaches have reported lower rates than observed in this study (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013). In this study we used a self-report measure which does not take into account impairment and clinical judgment of severity of symptoms. The increased prevalence of depressive symptoms in secondary schools in Kampala could be explained by the increasing number of children coming from war affected neighboring countries among other factors. It is also important to study the impact of ecological factors such as the crowdedness in these school on the psychological adjustment of these students. During data collection I observed that many schools had large numbers of learners but insufficient space for recreational activity. This may propagate inactivity in students.

### 5.3 Prevalence of symptoms of anxiety

This study found 38.5% (95%CI: 34.9-42.6) of the sample with significant symptoms of anxiety. These findings are comparable to rates observed in western (Bronsard, et al., 2011; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012;) and middle-eastern countries (Zarafshan, Mohammadi, & Salmanian, 2015). Findings in this study support the rates earlier observed among children and adolescents in rural Uganda (Abbo, et al., 2013) or among secondary school adolescent in Nigeria (Adewuya, Ola, & Adewumi, 2007). Anxiety disorders are listed as the most common mental health problems among adolescents (Bronsard, et al., 2011; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). These finding have serious implications for policy makers as they may account for poor performance and or high school dropout among adolescents. Although Adewuya, Ola, & Adewumi, (2007) attribute high anxiety rates among African children to cultural grooming that enforces obedience, self-control and emotional restraint, it is also important to look at discipline measures used in most Ugandan schools and families (Thumann, Nur, Naker, & Devries, 2016). The education systems broads fear and suppresses self-expression. These may contribute to symptoms of anxiety.

### 5.4 Prevalence of symptoms of somatic syndromes

Somatic syndromes are common among children and adolescents. This study further supports findings documented in systematic reviews (e.g Haller, Cramer, Lauche, & Dobos , 2015; King, et al., 2011; Kroner-Herwig, Gassmann, van Gessel, & Vath, 2011; Nyame, et al., 2010) and large epidemiological studies (Shanahan, et al., 2015). Meta-analysis of two studies included in Haller et al's (2015) systematic review showed a point prevalence of 40.2% for medically unexplained symptoms in 1237 participants. In the same study, meta-analysis of two studies examining12-months prevalence showed that medically unexplained symptoms exist in about 5 in 10 people (Haller, Cramer, Lauche, & Dobos , 2015). Both this

study and the cited studies examined symptoms rather than disorders. Findings in this study are also comparable to what has been observed in studies that used less restrictive diagnostic methods (Haller, Cramer, Lauche, & Dobos , 2015).

The rates found in the current study do not tally with the number of cases reported in health care systems which poses a question of how many of secondary school students with mental health problems are able to access treatment. This is particularly of concern to policy makers as calls for bridging the wide treatment gap observed in low and middle income countries tops the mental health agenda (see Eaton, et al., 2011; Rebello, Marques , Gureje , & Pike , 2014). It is also not clear whether the mental health problems are related to school dropout.

**5.5 Comorbidity**

The second objective of this study was to determine the comorbidity of symptoms of depression, anxiety and somatic syndromes among secondary school students. We note that 31.4% of the participants had significant symptoms of more than one of the three conditions under study. This concurs with what has been noted in other epidemiological studies (Abbo, et al., 2013; Cummings, Caporino, & Kendall, 2014; Li, et al., 2009) and systematic reviews (Hankin, et al., 2016).

In this study we observed that about 7 in 10 adolescents with symptoms of depression have symptoms of anxiety, whereas about 4 in 10 with symptoms of anxiety have symptoms of depression. This is consistent with what has been observed in other studies (Abbo, et al., 2013; Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Weersing, Rozenman, Maher-Bridge, & Campo, 2012) and most especially reviews (Hankin, et al., 2016). This high comorbidity has been attributed to symptom overlap and common etiological factors (Garber & Weersing, 2010; Hankin, et al., 2016). In this study, although there was significant

comorbidity between symptoms of anxiety and depression, anxiety seems to weakly overlap with depression. Like other scientists (e.g. Hankin, et al., 2016), I would argue that underlying fear in anxiety disorders would subsequently lead to depression but many anxieties are not severe enough that they may lead to significant distress. On the other hand, Garber et al (2010) explain that this discrepancy could be due to often unidentified sub threshold depressive symptoms among people with anxiety.

In this study, comorbidities between somatic symptoms and anxiety symptoms were more common than comorbidities between somatic symptoms and depression. In fact, 4 in 10 adolescents with somatic symptoms also had comorbid symptoms of depression. Whereas about 6 in 10 with somatic symptoms also had comorbid symptoms of anxiety. It was also noted that 78% of adolescents with symptoms of depression also had comorbid somatic symptoms. And 60% of adolescents with symptoms of anxiety also had comorbid somatic symptoms. These findings have a great deal in common with previous studies (Fischer, Gaab, Ehlert, & Nater, 2013; Hughes, Lourea-Waddell, & Kendall, 2007). There seems to be similar rates of co-occurrences between anxiety and somatic syndromes or somatic syndromes and anxiety. Both conditions largely manifest with somatic problems. Nevertheless, the high comorbidity between symptoms of depression, anxiety, and somatic syndromes could better be explained by cross-cutting underlying factors (Hankin, et al., 2016) that evolve through different pathways. Current debates support the idea that interventions should target transdiagnostic features across disorders (Fairholme, Carl, Farchione, & Schonwetter, 2012). Today, many interventions are being developed to target transdiagnostic features observed in emotional disorders (Bolton, et al., 2014). These finding therefore add to this body of literature in support of targeting transdiagnostic features if we are to have cost effective intervention. Further research is therefore needed to understanding and address these cross-cutting features.

### 5.6 Age as a risk factor

Our third objective was to determine the association between socio-demographic factors (age, gender, family composition) and symptoms of depression, anxiety and somatic syndromes.

Contrary to what has been observed in some studies (Wang, et al., 2015; Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015), in this sample, there was no association between age and symptoms of depression, anxiety or somatic syndromes. However, these findings are in line with what has been observed in research regarding depression (Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013) and anxiety (Adewuya, Ola, & Adewumi, 2007; Abbo, et al., 2013; Merikangas, et al., 2010). This could be explained by the homogeneity of the sample. Studies that did not find a significant relationship between depression and age particularly had a sample of adolescents (e.g. Nalugya-Sserunjogi, et al., 2016) apart from one (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015), whereas studies that noted a significant relationship were comparing children with adolescents (e.g. Wang, et al., 2015). With anxiety, relationships have been noted with respect to particular anxiety conditions such as social anxiety (e.g. Burstein, et al., 2011; Polo, Alegría, Chen, & Blanco, 2011) or obsessive compulsive disorders (e.g Huang, et al., 2014). Although there is consensus that internalizing problems markedly increase during adolescence (Cummings, Caporino, & Kendall, 2014; Hankin, et al., 2016), these findings seem to suggest that the prime age at which these problems emerge is during early adolescence and they stay relatively stable throughout adolescence. This study found no significant relationship between age and somatic syndromes, contrary to what has been reported a systematic review (Schulte & Petermann, 2011).

### 5.7 Gender as a risk factor

In this study, being female was associated with higher risk for symptoms of depression, anxiety and somatic syndromes. However, findings on anxiety have to be interpreted in light of the low reliability scores noted with the anxiety scale. These findings have been backed by evidence from previous studies (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Beesdo, Knappe, & Pine, 2009; Blanco, et al., 2014; Leiknes, Finset, Moum, & Sandanger, 2007). Similar finding have been noted in studies carried out in LMICs (Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013; Nalugya-Sserunjogi, et al., 2016). Little is known about how these differences emerge but some animal studies suggest the emergence of estrogen which impairs the functioning of the prefrontal cortex. In most African cultures, parents exercise more control over adolescent girls than they do for boys. Parents dictate what clothes they have to wear, what games they must not play and which people they should or should not interact with. They consider girls to be more vulnerable to sexual harassment during adolescence (Kyoheirwe-Muhanguzi, 2011; Pilgrim, et al., 2013). Depressive symptoms or somatic syndromes could be a psychological manifestation of the conflict between what society demands of them and their internal desires (Carr, 2016).

These findings support biological theories that have attributed depression to sex differences (Klein & Romeo, 2013). The increased rate of depression among females has been attributed to negative affectivity resulting from emergence of gonadotrophic hormones most especially progesterone and estrogen among girls. From the biopsychosocial perspective, it should be noted that it’s not entirely about the biological substrates dictated by hormonal changes, pubertal changes among girls are also associated with low self-esteem (Steiger , Allemand , Robins , & Fend , 2014) and interpersonal limitations (Teunissen, et al., 2011).

### 5.8 Family composition as a risk factor

Family composition was measured by the number of children in the household, number of adults in the household and living arrangement. In this study we found no significant relationship between number of children in the household and symptoms of depression, anxiety and somatic syndromes. Similarly there was no significant relationship between number of adults in the household and symptoms of depression, anxiety and somatic syndromes. These findings are not in support of what has been observed by Imran, Ani, Mahmood, Hassan, & Bhatti, (2014) among Pakistan children. They noted that depression among children was associated with increased numbers of siblings in the home. There was a significant association between living arrangement and symptoms of depression. There was also a significant association between living arrangement and somatic syndromes but not with symptoms of anxiety. These findings suggest that it doesn't matter how many people there are in the household but who constitute the household. Regression analysis shows that adolescents who were staying with friends were significantly more vulnerable to depression and somatic syndromes than those staying with both parents, father only, mother only, grandparent and relatives. These findings support what has been observed in studies done in Uganda (Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013), Iran (Daryanavard, et al., 2011), Jamaica (Ekundayo, et al., 2007) Norway (Sund, Larsson, & Wichstrøm, 2011). Staying with both parents is acknowledged as a protective factor. Literature on separation and attachment shows that disruptions in attachment early in life may have profound psychobiological effects and later social impairment (Schuengel, Oosterman, & Sterkenburg, 2009). The nature of early attachment is associated with affective mental health problems such as anxiety and depression (Lee & Hankin, 2009). Many dolescents face parental separations with intense negative emotions and reactions. Age appropriate developmental task may be difficult to attain as many find themselves taking on inappropriate responsibility

for their parents' well-being (CPS Statement, 2000). Structural family therapists have reported about the importance of family structure on children's adjustment (Carr, 2012). The issue of young children staying by themselves has been document in Uganda, mostly about the HIV/AIDS scourge on families. Death of parents has left many households child headed (Collins , et al., 2016), with children facing financial struggles that their needs cannot be met, others with financial assistance from NGOs or relatives. These findings expose psychological vulnerability among child headed families. Exposure to family problems early in life is a well-known predisposing factor to later depression.

It would be expected that absence of mother would carry a greater risk to depression among adolescents. Findings in this study show that absence of father rather than mother carries greater risk to depressive symptoms during adolescence. Similar observation was made by Culpin , Heron , Araya, and Joinson, (2015) especially among girls who have early menarche. Sander and McCarty, (2005) attribute this risk to negative interactions between mothers and children. In ugandan setting, single mothers are faced with the stress of meeting financial demands of the home in absence of the father, this often results into negative interactions with children.

### 5.9 Other findings

Depression was significantly associated with religion. Specifically the regression analysis showed that being Seventh Day Adventist increases risk for depression five times compared to being catholic. This link is difficult to interpret and it opens way to further research. Perhaps, it's not so much about religion but religiosity associated with particular religions just like what Jansen, Motley, & Hovey, (2010) observed among American students.

## 5.10 Findings in relation to theoretical framework

In the biopsychosocial model we note that symptoms of depression, anxiety and somatic complaints are a result of an interplay between the individual's biological attributes, mental health or personality characteristic and sociocultural environments. In this study we found that gender and living arrangement we the most important predictors of mental health. Below is a description of how the findings fit into this model.

Biological factors

This study set out to investigate the effects of age and gender on symptoms of depression. We noted that gender was significantly associated with symptoms of depression, anxiety and somatic complaints. Specifically being of the female gender poses greater risk for developing symptoms of depression, anxiety and somatic complaints. A finding that has been support in other studies done earlier. This finding could best be explained by differences in biological construction between males and females. Li, Lu, Wang, & Zhong, (2015) noted that although there may be no gender difference in emotional working memory, females experience negative emotions more intensely as compared to males.

Psychological factors

The interactions between gender and psychological factors is also important. In this study psychological factors were not directly studied. But the gender differences noted in psychological development would help us understand the potent associations between gender and symptoms of depression, anxiety and somatic complaints. Earlier research has shown that gender largely influences the coping style people use in face of stresses (Matud, 2004). Females are noted to take on more of emotional and avoidance coping as compared to men whereas men take on more of rational and detachment styles of coping.

Social factors

Engel recognized a bi-directional influence of the social contexts onto the individual. In the same light Bronfenbrenner stressed the importance of ecological contexts which he believed are multi layered (Bronfenbrenner & Morris, 2006). Extensive literature has emphasized family interaction- most especially relationships as crucial in the etiology of mental health problems. This study found that it was not only the relationships but even structure may have significant effect on one's adjustment. Findings showed that living arrangement strongly predicted symptoms of depression and somatic complaints. We observed that adolescents who were staying with friends rather than biological parents had greater risk of developing depressive symptoms. This tend to emphasize the importance of early childhood experiences in the development of maladjustment of children.

Religion was also found to be associated with symptoms of depression. Logistic regression showed that being seventh day Adventist increased the risk to symptoms of depression by five compared to being Catholic. To me I think it's not so much the religion but the practices or the degree of religiosity. Religion reflects the beliefs and practices of society.

**5.10 Limitations**

This study had some limitations. Firstly, it used a cross-sectional design which does not allow us to draw causal conclusions from the finding above. This therefore highlights the need for more longitudinal studies to establish causal factors to mental health problems among school children. Secondly, reliability coefficients for the anxiety scale used (Cronbach's alpha =0.53) were not satisfactory. This puts queries on the generalizability of the findings. Third, the findings are based on only adolescent's responses. Data from multiple sources would improve on the reliability of the findings.

## 5.11 Recommendations

Findings revealed that symptoms of depression, anxiety and somatic complaints were common in schools. It is therefore important that the school staffs are well equipped with skills to identify and take appropriate action in case a student presents with symptoms of depression, anxiety or somatic complaints.

These findings reinforce observations earlier made about the high comorbidities between depression, anxiety and somatic complaints. It also highlights possibility of these conditions having uniform etiology. This calls for further exploration of transdiagnostic factors to depression, anxiety and somatic complaints. Future research also needs to focus on developing and testing transdiagnostic interventions that are cost-effective for low and middle income countries.

Findings have also shown that the living arrangement of the adolescent plays a significant role to their psychological adjustment. Kampala is considered by many to be the citadel of quality education. Some students come from deep in the villages to stay with friends in order to access education. Findings have shown that adolescents staying with friends stand a higher risk to symptoms of depression, and somatic syndromes. Government policies should also take into account the living circumstances of students. Most of all, parents should try to monitor the living situations of their children in order to understand the impact it may have on their development.

## 5.12 Conclusion

Symptoms of depression, anxiety and somatic syndromes are common among adolescents in schools in Kampala. Comorbidities among symptoms of depression, anxiety and somatic syndromes were also common. Symptoms of depression, anxiety and somatic syndromes are more common among female adolescents than males. Who the adolescent

stays with rather than family size or number of siblings may have serious implications on psychological adjustment of adolescents. Adolescents staying with friends rather than any of their family members may have higher risk for developing symptoms of depression, and somatic syndromes. These findings highlight the need to plan for psychological problems among school children and adolescents

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## Appendix A: Introductory Letter to schools

BUTABIKA HOSPITAL

P.O.BOX 7017 KAMPALA

TEL: 0772835958

DATE:

TO

HEADTEACHER

Dear Sir/Madam

**RE: REQUEST TO CARRYOUT A STUDY**

I am a Clinical Psychologist working with Butabika Hospital and a student from Stellenbosch University. I am conducting a study on the **Prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda.** Your school is one of the schools that were randomly selected. I am requesting for your permission to carry out this study in your school. Attached is a KCCA permission letter and a brief description of the study. I will be grateful for your help.

Yours faithfully

……..

**Study title: The prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda**

Primary investigator: Nsereko James Roger
Add supervisor: Rizwana Roomaney
Add contact details: +256-772-835958

**Study background**

Up to 20% of children and adolescents worldwide have a mental disorder of some sort (Kieling et al., 2011). The Diagnostic Statistical Manual for Mental Disorder (version 5) (DSM 5) defines a mental disorder as a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning (American Psychiatric Association, 2013).

Few studies in Africa have examined the prevalence of mental health problems among children (Cortina et al., 2012). In Uganda, the focus has been on children in war torn environments in northern Uganda (Abbo et al., 2013; Kinyanda, Kizza, Levin, Ndyanabangi, & Abbo, 2011; Kinyanda et al., 2013; Mugisha, Muyinda, Malamba, & Kinyanda, 2015). Studies have also targeted particular groups of children, such as those receiving care for HIV/AIDS (Musisi & Kinyanda, 2009). Accounts of mental health problems in schools manifesting as demonic attacks have been reported (Kokota, 2011; Nakalawa, Musisi, Kinyanda, & Okello, 2010) but there remains little mental health services in schools in Uganda (Kigozi, Ssebunnya, Kizza, Cooper, & Ndyanabangi, 2010). In order to effectively plan for mental health services in schools there is need to determine the prevalence of mental health problems in school environments.

**Aim of the study**

This study aims to investigate the prevalence of symptoms of depression, anxiety and somatic syndromes and to examine association of these conditions with socio-demographic factors among secondary school students in Kampala

**Research design**

A cross sectional design will be used to determine the prevalence of symptoms of anxiety, depression and somatic syndromes under study. Five secondary schools randomly selected from the five divisions in Kampala will be included in the study.

**Data collection process**

This document aims at introducing the study to the school administration. Upon obtaining permission from the school administration the researcher will make arrangements for data collection. One class will be randomly selected. The researcher will explain the study to the

requirements for participation in the study. The assent form emphasises that participation is not mandatory- the student can choose to or not participate. Those who agree to participate will be invited to pick consent forms for their parents. Arrangements (place, date and time) for when data collection will take place will be discussed with the students. Data collection will be carried out during their free time. Only students who assent to participant and whose parents have consented will be interviewed.

**Benefits**

No direct benefit are attached to participating in the study. However the study findings can help in policy development for better management of mental health problems among school children. There are minimal risks to taking part in this study. However students in need of psychological help will be helped to access a counsellor.

**Managing data**

The records of this study will be kept private, and individual data will only be accessible by the researcher and his supervisor. The completed questionnaires will be collected and stored by the researcher in a safe place only accessible by the researcher. The data set will be stored on a password protected computer and only the principal investigator and his supervisor will have access to the data.

**If you have questions or want a copy or summary of the study results:**

Contact the researcher at the email address or phone number above. You will be given a copy of this form to keep for your records. If you have any questions about whether your child has been treated in an illegal or unethical way, contact:

1. Mr Nsereko James Roger, nsereko66james@yahoo.com or +256772835958,
2. Ms Rizwana Roomaney, Department of Psychology Stellenbosch University, rizwanaroomaney@sun.ac.za, +27218083973
3. Uganda National Council of Science and Technology by Telephone: +256 41 4750500, Plot 6 Kimera Rd, Kampala.P.O.Box. 6884, Kampala
4. Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development

**Request for a written permission**

**Statement of permission:**

I have read the above information, and received answers to any questions. I hereby grant permission to Nsereko James Roger to carry out the research study on the "prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda" in my school.

_____ _____

Name and Signature of school head/representative Date

**SIGNATURE OF INVESTIGATOR**

I declare that I explained the information given in this document to _____ and/or [his/her] representative _____ *[He*/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Luganda/*English/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

_____ _____

**Names & Signature of Investigator** Date

**Appendix B: Permission letter from Kampala Capital City Authority (KCCA)**

KCCA
KAMPALA CAPITAL CITY AUTHORITY
*For a better City*

**DIRECTORATE OF EDUCATION AND SOCIAL SERVICES**

**REF: DES/KCCA/508**

24th October, 2016

Mr. Nsereko James Rogers
Clinical Psychologist
P.O. Box 7017
**KAMPALA**

**RE: PERMISSION TO CARRY OUT RESEARCH**

The above subject refers.

Permission is hereby granted for you to collect data for a study entitled **"the prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala"**

You are expected to exercise utmost ethical treatment of study subjects, consented participation and that the results of the study will be used for academic purposes only. You will also be expected to share your research report with KCCA.

For a better City

**Namuddu Juliet Nambi**
**DIRECTOR EDUCATION AND SOCIAL SERVICES**

**Copy:** Supervisors Education Services

P.O. Box 7010 Kampala
Plot 1-3 Apollo Kaggwa Road
Tel: 0204 660 000

## Appendix C: Parent Consent form

### The prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda

**Consent form for parents/guardians**

Principal investigator: Mr Nsereko James Roger
Supervisor: Ms RizwanaRoomaney
Contact details: 20659504@sun.ac.za, nsereko66james@yahoo.com or +256-772-835958
Department of Psychology Stellenbosch University

Dear Parent,

Your child is invited to take part in a research study that aims to investigate the prevalence of symptoms of depression, anxiety and somatic syndromes and to examine association of these conditions with socio-demographic factors among secondary school students in Kampala. This study is part of the requirements for the award of a master's degree. The study is sponsored by AFFIRM project based in Stellenbosch University- South Africa.

**What the study is about:**

The study aims at determining how common depression, anxiety and somatic symptoms are secondary school populations. It also aims at establishing if there is an association between these symptoms and socio-demographic factors like family composition.

**What your child will be asked to do:**

The researcher will explain the study objectives to all students. He will also let them know that participation is not mandatory- they have a right to choose to/not to participate in the study. He will seek for their consent. Those who have consented and their parents/guardians have consented will take part in the study. Your child will be asked to complete a questionnaire. The child is not required to write their name on the questionnaire. The process will take about 30 minutes and the questionnaire will be filled during their free time, - not class time. I hope to interview 700 students from various schools.

**Risks and benefits:**

There are no direct benefits to participating in the study. However the findings will help in policy development for better management of mental health problems among school children.There are minimal risks to taking part in this study. Answering questions about depression, anxiety or recurrent pains may make your child uncomfortable. However some people find it relieving talking about painful experiences. If your child feels distressed and would like to talk to a counsellor, the researcher will arrange for an appointment with a counsellor.

**Taking part is voluntary:**

Your consent and your child's participation in the study are completely voluntary. Your child can withdraw from the study at any time without consequences of any kind and you can withdraw your consent at any time without of any kind. In the questionnaire the child can choose to skip any questions they don't feel comfortable answering. Participating in the study does not mean that you are or your child is giving up ant legal rights.

1

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P. O. BOX 7161 KAMPALA (U)

**Your child's answers will be kept confidential:**

The records of this study will be kept private, and individual data will only be accessible by the researcher. The completed questionnaires will be collected and stored by the researcher in a safe place only accessible by the researcher. The data set will be stored on a password protected computer and only the principal investigator will have access to the data.

**If you have questions or want a copy or summary of the study results:**

Contact the researcher at the email address or phone number above. You will be given a copy of this form to keep for your records. If you have any questions about whether your child has been treated in an illegal or unethical way, contact:

1. Ms. RizwanaRoomaney [rizwanaroomaney@sun.ac.za; 021 808 3973] at the Department of Psychology, Stellenbosch University, South Africa.
2. MsMaléneFouché [mfouche@sun.ac.za; +2721 808 4622] at the Division for Research Development. Stellenbosch University.
3. Uganda National Council of Science and Technology by Telephone:041 4705500, Plot 6 Kimera Rd, Kampala.P.O.Box. 6884, Kampala.

This study has been approved by a Ugandan research ethical committee- (Mengo hospital). If you have questions regarding this study or rights of the participants, contact:

1. Prof. M. G. Kawooya. Chairperson -Mengo Hospital Research Ethic Committee. P.O.Box 7161 Kampala, Tel: 256-414 270222/3

**Statement of consent:**

I have read the above information, and received answers to any questions. I consent to allow my child to take part in the research study of *The prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda*

*Child's Name:*

_____

_____ _____ _____

Parent's/Guardian's Names Signature Date

**SIGNATURE OF INVESTIGATOR**

I declare that I explained the information given in this document to _____ and/or [his/her] representative _____ *[He/she]* was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Luganda/*English/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

_____ _____

**Name &Signature of Investigator** **Date**

2

## Appendix D: Assent form

STELLENBOSCH UNIVERSITY

PARTICIPANT INFORMATION LEAFLET AND ASSENT FORM

**Title of the research project:** The prevalence and risk factors of anxiety, depression, and somatic complaints among secondary school students in Kampala, Uganda

**Researchers name(s):** Nsereko James Roger
**Supervisor:**RizwanaRoomaney

**ADDRESS:** Department of Psychology Stellenbosch University
20659504@sun.ac.za, nsereko66james@yahoo.com

**CONTACT NUMBER:**+256-772-835958

**What is RESEARCH?**
Research is something we do to find **NEW KNOWLEDGE** about the way things (and people) work.We use research projects or studies to help us find out more about children and teenagers and the things that affect their lives, their schools, their families and their health. We do this to try and make the world a better place!

**What is this research project all about?**
In this research we would like to know how many adolescents experience anxiety, depression (extreme sadness) or recurrent body pains. We also want to understand the factors that contribute to development of such conditions.

**Why have I been invited to take part in this research project?**
Through a random process only five schools were selected from hundreds of schools in Kampala. From each school, I hope to interview 155 students randomly selected from various classes. For example in your school there are many classes and streams. All these classes were written on small papers- folded and the researcher randomly picked a paper- this paper had your class number written on it. So your class was selected to participate in the study. But before you participate- I want to first seek your consent to participate. You are free not toparticipate. I humbly request you to participate in generating knowledge that will help improve the lives of many young people like you in this country.

1

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**Who is doing the research?**
My name is James Roger Nsereko, I am a student in Stellenbosch University, and I am also a Clinical Psychologist with Butabika hospital.With sponsorship from the African Focus on Intervention Research for Mental health(AFFIRM) project in Stellenbosch University, I am doing this research as part of my studies.

**What will happen to me in this study?**
I will ask you to answer a set of questions about how your life has been. These questions will be presented in a booklet and you will be requested to write your answers in this booklet. There will be questions about your experience with depression, anxiety and recurrent body pains. If you agree to participate in this study, it will take about 20-30 minutes of your time.

**Can anything bad happen to me?**
There are minimal risks to taking part in this study. Answering questions about depression, anxiety or recurrent pains may make you uncomfortable. However some people find it relieving talking about their feelings and experiences. If you feel that you would like to talk to a counsellor about your feelings you can approach the researcher with your details and he will arrange for an appointment with a counsellor for you.

**Can anything good happen to me?**
If you take part in this study, there will be no direct benefits for you (e.g. money, marks, or eats). However your participation will help us gain more understanding of problems young people like you face. This will help in improving care for young people in the country. There will be no remuneration for taking part in the study. We will communicate our findings in our report to all school that have participated (the report will not show who participated in the study.).

**Will anyone know I am in the study?**
All information you provide in the study will be kept confidential in the following ways. First you will not be required to write your name on the questionnaire, so I will not know which questionnaire was written by whom. All questionnaires will be kept safely and can only be accessed by the researcher and supervisor.

**Who can I talk to about the study?**
This study has been approved by an accredited Ugandan Research Ethical Committee in Mengo Hospital. If you have any questions about your rights as a participant, concerns or complaints, you can contact

1. Nsereko James Roger, nsereko66james@yahoo.comor +256772835958,
2. Ms.RizwanaRoomaney, rizwanaroomaney@sun.ac.za or +2721 8083973, Department of Psychology Stellenbosch University
3. Uganda National Council of Science and Technology by Telephone: 041 4705500, Plot 6 Kimera Rd, Kampala.P.O.Box. 6884, Kampala.



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If you have questions regarding your rights as a research subject, contact

1. MsMaléneFouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.
2. Prof.M.G. Kawooya Chairperson -Mengo Hospital Research Ethic Committee. P.O.Box 7161 Kampala, Tel: 256-414 270222/3

**What if I do not want to do this?**

Taking part in this study is fully up to you. You can refuse to participate even if your parent has agreed to your participation. You can decide to dropout at any time. Nothing bad will happen to you. Your decision is very important.

Do you understand this research study and are you willing to take part in it?

YES NO

Has the researcher answered all your questions?

YES NO

Do you understand that you can STOP being in the study at any time?

YES NO

Names of the child Signature Date

Name of researcher Signature Date

3

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## Appendix E: Study questionnaire- Socio-demographics and YSR

1

**Socio-demographics**

| **Demographics** | | | Official use |
|---|---|---|---|
| 1 | How old are you? | | |
| 2 | What is your gender | ☐ Male<br>☐ Female | |
| 3 | What class are you? | ☐ S.2<br>☐ S.3<br>☐ S.4<br>☐ S.5<br>☐ S.6 | |
| 4 | What is your religion | ☐ Catholic<br>☐ Protestant<br>☐ Moslem<br>☐ SDA<br>☐ Pentecostal Christian<br>☐ Other? | |
| | How committed are you to your religion? | ☐ Not at all<br>☐ Moderately committed<br>☐ Very committed | |
| | How Committed are your family members to religion | ☐ Not at all<br>☐ Moderately committed<br>☐ Very committed | |
| **Family composition** | | | |
| 5 | At home, who do you stay with? | ☐ With both parents<br>☐ Father only<br>☐ Mother only<br>☐ Grand parent<br>☐ Paternal relative<br>☐ Maternal relative<br>☐ Other | |

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| | | | |
|---|---|---|---|
| 6 | How is your relationship with the person(s) you stay with mentioned above [Qn5] | Father ☐GOOD ☐BAD<br>Mother ☐GOOD ☐BAD<br>Grand parent ☐GOOD ☐BAD<br>Paternal relative ☐GOOD ☐BAD<br>Maternal relative ☐GOOD ☐BAD<br>Other ☐GOOD ☐BAD | |
| 7 | How many children below age 18 live in your home | | |
| 8 | How many adults above age 18 stay in your home | | |
| | | | |
| 9 | How much education does your father have? | ☐ Never gone to school<br>☐ Primary level<br>☐ O-level<br>☐ A-level<br>☐ A tertiary institution level<br>☐ University level | |
| 10 | How much education does your Mother have? | ☐ Never gone to school<br>☐ Primary level<br>☐ O-level<br>☐ A-level<br>☐ A tertiary institution level<br>☐ University level | |
| 11 | How much education does your Guardian have? | ☐ Never gone to school<br>☐ Primary level<br>☐ O-level<br>☐ A-level<br>☐ A tertiary institution level<br>☐ University level | |

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**Youth Self-Report (YSR 11-18)**

Below is a list of items that describe kids. For each item, tick the box next to the response that best describes you ***now or within the past 6 months***. You can tick the first box- if the item is not true of you, tick the second box if the item is somewhat or sometimes true of you, and tick the third box if the item is very true or often true about you.

| | | | |
|---|---|---|---|
| 12 | There is very little that I enjoy | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR5 |
| 13 | I'm too dependent on adults | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR11 |
| 14 | I cry a lot | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR14 |
| 15 | I deliberately try to hurt or kill myself | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR18 |
| 16 | I don't eat as well as I should | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR24 |
| 17 | I am afraid of certain animals, situation or places, other than school(describe) | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR29 |
| 18 | I am afraid of going to school | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR30 |

| | | | |
|---|---|---|---|
| 19 | I am afraid I might think or do something bad | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR31 |
| 20 | I feel that I have to be perfect | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR32 |
| 21 | I feel that no one loves me | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR33 |
| 22 | I feel worthless or inferior | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR35 |
| 23 | I would rather be alone than with others | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR42 |
| 24 | I am nervous or tense | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR45 |
| 25 | I have nightmares | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR47 |
| 26 | I can do certain things better than most kids | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR49 |
| 27 | I am too fearful or anxious | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR50 |

| | | | |
|---|---|---|---|
| 28 | I feel dizzy or lightheaded | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR51 |
| 29 | I feel too guilty | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR52 |
| 30 | I feel overtired without good reason | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR54 |
| 31 | Aches or pains(not stomach or headaches) | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56a |
| 32 | Headaches | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56b |
| 33 | Nausea, feel sick | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56c |
| 34 | Problems with eyes (not if corrected by glasses) | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56d |
| 35 | Rashes or other skin problems | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56e |
| 36 | Stomach-aches | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56f |

| | | | |
|---|---|---|---|
| 37 | Vomiting, throwing up | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR56g |
| | Other (describe) | | YSR56h |
| 38 | I refuse to talk | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR65 |
| 39 | I am secretive or keep things to myself | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR69 |
| 40 | I am self-conscious or easily embarrassed | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR71 |
| 41 | I am too shy or timid | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR75 |
| 42 | I think about killing myself | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR91 |
| 43 | I have trouble sleeping (describe) | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR100 |
| 44 | I don't have much energy | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR102 |
| 45 | I am unhappy, sad or depressed | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR103 |

| | | | |
|---|---|---|---|
| 46 | I keep from getting involved with others | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR111 |
| 47 | I worry a lot | ☐ Not true<br>☐ Somewhat/sometimes true<br>☐ Very true/often true | YSR112 |

## Appendix F: Authorization letter to use the Youth Self Report (11-18)

The University of Vermont

**ASEBA**
**Research Center for Children, Youth & Families, Inc.,/ASEBA,**
**A Non-Profit Corporation**
**1 South Prospect Street, St Joseph's Wing (Room #3207), Burlington, VT 05401**
**Telephone: (802)656-5130 / Fax: (802)656-5131**
**Email: mail@aseba.org / Website: http://www.aseba.org**

**Site License Agreement to Permit James Roger Nsereko to Reproduce the Youth Self-Report (YSR)**

This Site License Agreement (the "Agreement") is entered into by and between Research Center for Children, Youth, & Families, Inc. ("Licensor"), and James Roger Nsereko ("Licensee"). Licensee must sign and return the signed Agreement to Licensor. The Agreement shall not be effective until the date ("Effective Date") when signed by Licensor. The parties agree to the following terms and conditions:

**1. License # 1306-03-07-16**

In accordance with the terms herein, Licensor grants to Licensee a non-exclusive and non-transferable license to produce 736 copies of theYSR. The Licensed Form(s) will be used between the "Effective Date" and August 31, 2016 solely in "The prevalence and risk factors of anxiety, depression, and somatic complaints among secondary school students in Kampala, Uganda" study.

***Note:*** It is ***not*** permitted to reproduce subsets of ASEBA problem items. For forms other than BPMs, the following exceptions are allowed: Open-ended problem items (e.g., CBCL/6-18 *56h* and *113*), plus ≤8 other problem items can be omitted. It is also permitted to omit instructions to describe problems, as well as pp. 1-2 of the CBCL/6-18, TRF, YSR, ASR, ABCL, OASR, and OABCL.

**2. Price and Payment**

The License is granted without charge. The License rights expire on August 31, 2016.

**3. Scoring Data Acquired with the Licensed Form(s)**

Licensee assumes responsibility for scoring all data acquired using the Licensed Form(s). Licensor strongly recommends that all data be entered into ASEBA software and be scored within the ASEBA software's rigorously tested environment. Licensor is not obligated to provide support to Licensee for scoring data outside of the ASEBA software. Any support needed by Licensee for scoring data outside of the ASEBA software will incur additional fees.

**4. Licensee Obligations**

Licensee acknowledges that in addition to its other obligations under this Agreement, James Roger Nsereko shall serve as Licensed Site Manager who shall be responsible, directly or by designee, for:

(a) Ensuring the Licensed Form(s) are used only in "The prevalence and risk factors of anxiety, depression, and somatic complaints among secondary school students in Kampala, Uganda" study.

(b) Ensuring the study is conducted in accordance with professional psychological assessment standards.

(c) Ensuring that Page 1 of all copies of the Licensed Form(s) bear the following statement:

Copyright T.M. Achenbach. Reproduced under License 1306-03-07-16.

Site Manager's address is: Butabika Hospital, Butabika, Kampala 256, Uganda; e-mail: nsereko66james@yahoo.com; tel: +256 772 835958.

3/31/2016

**5. Title to Licensed Form(s) and Confidentiality**

The Licensed Form(s), and all copies thereof, are proprietary to Licensor and title thereto remains in Licensor. All applicable rights to patents, copyrights, trademarks and trade secrets in the Licensed Form(s) or any modifications thereto made at Licensee's request, are and shall remain in Licensor. Licensee shall not sell, transfer, publish, disclose, display or otherwise make available the Licensed Form(s) or copies thereof, to anyone other than employees, consultants and contractors of Licensee and to people completing the Licensed Form(s).

Licensee agrees to secure and protect the Licensed Form(s) and copies thereof, in a manner that ensures they are used only in accordance with the rights licensed herein. Licensee also agrees to take appropriate action by instruction or agreement with its employees, consultants and contractors who are permitted access to the Licensed Form(s) to ensure use only in accordance with the rights licensed herein. Licensee shall not use the Licensed Form(s) as a reference to develop competing materials.

Licensee additionally agrees that the official ASEBA name(s) of the Licensed Form(s) will be retained in all references to the Licensed Form(s). For example, the Child Behavior Checklist for Ages 6-18 must be referred to by this name or its acronym CBCL/6-18.

**6. Use and Training**

Licensee shall limit the use of the Licensed Form(s) to its employees, consultants and contractors who have been appropriately trained.

**7. Warranty**

(a) Licensor warrants that the Licensed Form(s) will conform, as to all substantial features, to the documentation provided in the 2001 *Manual for the ASEBA School-Age Forms & Profiles*.

(b) The Licensee must notify Licensor in writing, within ninety (90) days of the effective date of this Agreement, of its claim of any defect. If the Licensor finds the Form(s) to be defective, Licensor's sole obligation under this warranty is to remedy such defect in a manner consistent with Licensor's regular business practices.

(c) THE ABOVE IS A LIMITED WARRANTY AND IT IS THE ONLY WARRANTY MADE BY LICENSOR. LICENSOR MAKES AND LICENSEE RECEIVES NO OTHER WARRANTY EXPRESS OR IMPLIED AND THERE ARE EXPRESSLY EXCLUDED ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. LICENSOR SHALL HAVE NO LIABILITY WITH RESPECT TO ITS OBLIGATIONS UNDER THIS AGREEMENT FOR CONSEQUENTIAL, EXEMPLARY, OR INCIDENTAL DAMAGES EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE STATED EXPRESS WARRANTY IS IN LIEU OF ALL LIABILITIES OR OBLIGATIONS OF LICENSOR FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE DELIVERY, USE, OR PERFORMANCE OF THE LICENSED FORM(S).

(d) Licensee agrees that Licensor's liability arising out of contract, negligence, strict liability in tort or warranty shall not exceed any amounts payable to Center by Licensee for the Licensed Form(s) identified above.

**8. Termination**

Licensor shall have the right to terminate this Agreement and license(s) granted herein:

(a) Upon thirty (30) days' written notice in the event that Licensee, its officers or employees violates any material provision of this Agreement, including but not limited to, the confidentiality provisions and use restrictions in the license grant, and is unable to cure such breach during such thirty (30) day period; or

(b) In the event Licensee (i) terminates or suspends business; (ii) becomes subject to any bankruptcy or insolvency proceeding under Federal or state statute or (iii) becomes insolvent or becomes subject to direct control by a trustee, receiver or similar authority.

In the event of termination by reason of the Licensee's failure to comply with any part of this Agreement, or upon any act which shall give rise to Licensor's right to terminate, Licensor shall have the right to take immediate possession of the Licensed Form(s) and all copies wherever located, without demand or notice. Within five (5) days after termination of the License, Licensee will return to Licensor the Licensed Form(s), and all copies. Termination under this paragraph shall not relieve Licensee of its obligations regarding confidentiality of the Licensed Form(s). Termination of the license shall be in addition to and not in lieu of any equitable remedies available to Licensor.

9. General

(a) Each party acknowledges that it has read this Agreement, it understands it, and agrees to be bound by its terms, and further agrees that this is the complete and exclusive statement of the Agreement between the parties, which supersedes and merges all prior proposals, understandings and all other agreements, oral and written, between the parties relating to this Agreement. This Agreement may not be modified or altered except by written instrument duly executed by both parties.

(b) Dates or times by which Licensor is required to make performance under this Agreement shall be postponed automatically to the extent that Licensor is prevented from meeting them by causes beyond its reasonable control.

(c) This Agreement and performance hereunder shall be governed by the laws of the State of Vermont.

(d) No action, regardless of form, arising out of this Agreement may be brought by Licensee more than two years after the cause of action has arisen.

(e) If any provision of this Agreement is invalid under any applicable statute or rule of law, it is to the extent to be deemed omitted.

(f) The Licensee may not assign or sub-license, without the prior written consent of Licensor, its rights, duties or obligations under this Agreement to any person or entity, in whole or in part.

(g) Licensor shall have the right to collect from Licensee its reasonable expenses incurred in enforcing this Agreement, including attorney's fees.

(h) The waiver or failure of Licensor to exercise in any respect any right provided for herein shall not be deemed a waiver of any further right hereunder.

Accepted and Agreed to:

LICENSOR:

Thomas M. Achenbach, Ph.D.

Signature: _____

Title: President, Research Center for Children, Youth & Families, Inc.

Date: 30 March 2016

For License # 1306-03-07-16

Accepted and Agreed to:

LICENSEE:

James Roger Nsereko

Signature: _____

Print name: Nsereko James

Title: Senior Clinical Psychologist

Address: Butabika Hospital

Date: 28/3/2016

## Appendix G: Ethical Clearance from Stellenbosch University REC.

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jou kennisvennoot • your knowledge partner

### Approved with Stipulations

**Response to Modifications- (New Application)**

20-Jan-2017
Nsereko, James JR

**Proposal #: SU-HSD-003548**

**Title:** **The prevalence and risk factors of symptoms of depression, anxiety and somatic complaints among secondary school students in Kampala, Uganda**

Dear Mr James Nsereko,

Your **Response to Modifications -** ***(New Application)*** received on **14-Dec-2016**, was reviewed by members of the **Research Ethics Committee: Human Research (Humanities)** via Expedited review procedures on **20-Jan-2017**.

Please note the following information about your approved research proposal:

Proposal Approval Period: **20-Jan-2017 -19-Jan-2018**

The following stipulations are relevant to the approval of your project and must be adhered to:
**1) The 'letter' aimed at school principals requesting permission is presented as an Informed consent form. This is inappropriate. This should indeed be a formal letter, addressed to the school principal requesting written permission. The letter could contain a separate 'tear-off' section at the end where the Principal signs. [ACTION AND RESPONSE REQUIRED].**
**2) The assent form is well written. Consider removing the picture as this is an older age group.**
**3) Permission from individual schools should be obtained before the study begins. [ACTION REQUIRED]**

Please provide a letter of response to all the points raised IN ADDITION to HIGHLIGHTING or using the TRACK CHANGES function to indicate ALL the corrections/amendments of ALL DOCUMENTS clearly in order to allow rapid scrutiny and appraisal.

Please take note of the general Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

Please remember to use your **proposal number** (**SU-HSD-003548**) on any documents or correspondence with the REC concerning your research proposal.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Also note that a progress report should be submitted to the Committee before the approval period has expired if a continuation is required. The

Committee will then consider the continuation of the project for a further year (if necessary).

This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki and the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health). Annually a number of projects may be selected randomly for an external audit.

National Health Research Ethics Committee (NHREC) registration number REC-050411-032.

We wish you the best as you conduct your research.

If you have any questions or need further help, please contact the REC office at 218089183.

**Included Documents:**
DESC Report 1
DESC Report
Humanities- REC letter_Nsereko.pdf
DESC Report 2
REC: Humanities New Application

Sincerely,

Clarissa Graham
REC Coordinator
Research Ethics Committee: Human Research (Humanities)

# Investigator Responsibilities

## Protection of Human Research Participants

Some of the general responsibilities investigators have when conducting research involving human participants are listed below:

1.Conducting the Research. You are responsible for making sure that the research is conducted according to the REC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research. You must also ensure that the research is conducted within the standards of your field of research.

2.Participant Enrollment. You may not recruit or enroll participants prior to the REC approval date or after the expiration date of REC approval. All recruitment materials for any form of media must be approved by the REC prior to their use. If you need to recruit more participants than was noted in your REC approval letter, you must submit an amendment requesting an increase in the number of participants.

3.Informed Consent. You are responsible for obtaining and documenting effective informed consent using **only** the REC-approved consent documents, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. Keep the originals in your secured research files for at least five (5) years.

4.Continuing Review. The REC must review and approve all REC-approved research proposals at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period.** Prior to the date on which the REC approval of the research expires, **it is your responsibility to submit the continuing review report in a timely fashion to ensure a lapse in REC approval does not occur.** If REC approval of your research lapses, you must stop new participant enrollment, and contact the REC office immediately.

5.Amendments and Changes. If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, number of participants, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the REC for review using the current Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written REC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the REC should be immediately informed of this necessity.

6.Adverse or Unanticipated Events. Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research related injuries, occurring at this institution or at other performance sites must be reported to Malene Fouch within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the RECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch Universtiy Research Ethics Committee Standard Operating Procedures. All reportable events should be submitted to the REC using the Serious Adverse Event Report Form.

7.Research Record Keeping. You must keep the following research related records, at a minimum, in a secure location for a minimum of five years: the REC approved research proposal and all amendments; all informed consent documents; recruiting materials; continuing review reports; adverse or unanticipated events; and all correspondence from the REC

8.Provision of Counselling or emergency support. When a dedicated counsellor or psychologist provides support to a participant without prior REC review and approval, to the extent permitted by law, such activities will not be recognised as research nor the data used in support of research. Such cases should be indicated in the progress report or final report.

9.Final reports. When you have completed (no further participant enrollment, interactions, interventions or data analysis) or stopped work on your research, you must submit a Final Report to the REC.

10.On-Site Evaluations, Inspections, or Audits. If you are notified that your research will be reviewed or audited by the sponsor or any other external agency or any internal group, you must inform the REC immediately of the impending audit/evaluation.

## Appendix H: Ethical Clearance from Uganda National Council Science and Technology

**Uganda National Council for Science and Technology**

*(Established by Act of Parliament of the Republic of Uganda)*

UNCST

Our Ref: **SS81ES** **7th August 2017**

Mr. James Nsereko
Principal Investigator
Butabika National Mental Referral Hospital
**Kampala**

Dear Mr. Nsereko,

I am pleased to inform you that on **07/08/2017**, the Uganda National Council for Science and Technology (UNCST) approved your study titled, **The Prevalence and Risk Factors of Symptoms of Depression, Anxiety and Somatic Complaints among Secondary School Students in Kampala, Uganda**. The Approval is valid for the period of **07/08/2017** to **07/08/2019**.

Your study reference number is **SS81ES**. Please, cite this number in all your future correspondences with UNCST in respect of the above study.

Please, note that as Principal Investigator, you are responsible for:

1. Keeping all co-investigators informed about the status of the study.
2. Submitting any changes, amendments, and addenda to the study protocol or the consent form, where applicable, to the designated local Research Ethics Committee (REC) or Lead Agency, where applicable, for re-review and approval prior to the activation of the changes.
3. Notifying UNCST about the REC or lead agency approved changes, where applicable, within five working days.
4. For clinical trials, reporting all serious adverse events promptly to the designated local REC for review with copies to the National Drug Authority.
5. Promptly reporting any unanticipated problems involving risks to study subjects/participants to the UNCST.
6. Providing any new information which could change the risk/benefit ratio of the study to the UNCST for review.
7. Submitting annual progress reports electronically to UNCST. Failure to do so may result in termination of the research project.

Please, note that this approval includes all study related tools submitted as part of the application.

Yours sincerely,

Hellen Opolot
For: Executive Secretary
**UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY**

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