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PREVALENCE AND CORRELATES OF SUICIDAL IDEATION AMONG STUDENTS IN SUB-SAHARAN AFRICA

By

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J.D., UNIVERSITY OF PENNSYLVANIA
B.A., BINGHAMTON UNIVERSITY

A Thesis Submitted to the Graduate Faculty
of Georgia State University in Partial Fulfillment
of the Requirements for the Masters in Public Health Degree

Master of Public Health
Atlanta, GA 30303

PREVALENCE AND CORRELATES OF SUICIDAL IDEATION
AMONG STUDENTS IN SUB-SAHARAN AFRICA

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AUTHOR'S STATEMENT PAGE

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ABSTRACT

JANE B. PALMIER
Prevalence and correlates of suicidal ideation among students in sub-Saharan Africa

OBJECTIVES: The purpose of this study is to compare the prevalence and correlates of suicidal ideation youth in Botswana, Kenya, Tanzania, Uganda and Zambia, all sub-Saharan African countries. This study also addressed differences in prevalence and correlates of suicidal ideation between boys and girls in each country in an attempt to identify how these risk behaviors vary by gender across country settings. Findings from this study are important for prevention efforts that seek to reduce suicidal behavior among youth in sub-Saharan African countries and to promote research and prevention efforts in the mental health area in these under-resourced countries.

METHODS: Analyses are based on the Global School-Based Student Health Survey (GSHS) conducted in Botswana (N=2197; 2005), Kenya (N=3691; 2003), Tanzania (N=2176; 2006), Uganda (N=3215; 2003) and Zambia (N=2257; 2004) of students primarily 13 to 16 years of age. Logistic regression analyses were computed to determine the associations between 13 risk factors (i.e., hunger, current alcohol use, problem drinking, bullying victimization, sadness, loneliness, worrying, having no close friends, missed school, illicit drug use, physical fights, physical attacks and early sexual initiation) and suicidal ideation for all students and between boys and girls.

RESULTS: The results showed variability in the prevalence of suicidal ideation across these African countries. Zambia had the highest prevalence of suicidal ideation (31.9%) among all students, followed by Kenya (27.9%), Botswana (23.1%), Uganda (19.6%) and Tanzania (11.2%). Sadness and feeling lonely was the most commonly associated correlate of suicidal ideation among students across these sub-Saharan countries. Sadness was significantly associated with suicidal ideation in Kenya, Tanzania and Uganda. Sadness remained significantly associated among boys and girls in Kenya, Tanzania and Uganda. All risk factors, except for having no close friends, were found to be predictors of suicidal ideation in certain countries or gender groups.

CONCLUSION: The associations between the risk factors examined and suicidal ideation have helped to increase the understanding of an ignored, but critical issue in Sub-Saharan Africa. There is an urgent need for additional research in this area in addition to greater suicide prevention efforts in sub-Saharan African countries.

CHAPTER I

INTRODUCTION

1.1 Background: Suicide as a Public Health Problem

Every year, almost one million people die from suicide; a "global" mortality rate of 16 per 100,000, or one death every 40 seconds (World Health Organization [WHO], 2011). Suicide is among the three leading causes of death among those aged 15-44 years in some countries; however, these figures do not include suicide attempts which are up to 20 times more frequent than completed suicide (WHO, 2011). Suicide worldwide is estimated to represent 1.8% of the total global burden of disease in 1998, and 2.4% in countries with market and former socialist economies in 2020 (WHO, 2011).

In the U.S., where most of the suicide research has been conducted, suicide is the 11th leading cause of death. (Centers for Disease Control and Prevention [CDC], 2010). But suicide deaths are only part of the problem. More people survive suicide attempts than actually die. They are often seriously injured and need medical care. More than 34,000 people in the U.S. kill themselves each year (CDC, 2010). More than 376,000 people with self-inflicted injuries are treated in emergency rooms each year (CDC, 2010). Suicide (i.e., taking one's own life) is a serious public health problem that affects even young people. For youth between the ages of 10 and 24, suicide is the third leading cause of death in the U.S. The top three methods used in suicides of young people include firearm (46%), suffocation (37%), and poisoning (8%). (CDC, 2009).

As with the overall population, deaths from youth suicide are only one part of this serious problem. More young people survive suicide attempts than actually die. A nationwide survey of

youth in grades 9-12 in public and private schools in the U.S. found that 15% of students reported seriously considering suicide, 11% reported creating a plan, and 7% reporting trying to take their own life in the 12 months preceding the survey. Each year, approximately 149,000 youth between the ages of 10 and 24 receive medical care for self-inflicted injuries at Emergency Departments across the U.S. (CDC, 2010).

Suicide, by definition, is fatal. Those who attempt suicide and survive may have serious injuries like broken bones, brain damage, or organ failure. Also, people who survive often have depression and other mental health problems. Suicide also affects the health of the community. Family and friends of people who commit suicide may feel shock, anger, guilt, and depression. The medical costs and lost wages associated with suicide also take their toll on the community (CDC, 2010). Suicidal behavior ranges in degree from merely thinking about ending one's life, through developing a plan to commit suicide and obtaining the means to do so, attempting to kill oneself, to finally carrying out the act (''completed suicide'') (Krug, E.G., Dahlberg, L.L., Mercy, J.A., Zwi, A.B., & Lozano, R., 2002).

Rates of suicide are not distributed equally throughout the general population. One important demographic marker of suicide risk is age. Globally, suicide rates tend to increase with age, although some countries such as Canada have also recently seen a secondary peak in young people aged 15–24 years. The rates ranged from 0.9 per 100 000 in the group aged 5–14 years to 66.9 per 100 000 among people aged 75 years and older. In general, suicide rates among those aged 75 years and older are approximately three times higher than those of young people aged 15–24 years. This trend is found for both sexes, but is more marked among men. For women, suicide rates present differing patterns. In some cases, female suicide rates increase steadily with

age, in others the rates peak in middle age, and in yet others, particularly in developing countries and among minority groups, female rates peak among young adults (Krug et al., 2002).

Suicidal behavior has a large number of underlying causes. The factors that place individuals at risk for suicide are complex and interact with one another. Identifying these factors and understanding their roles in both fatal and non-fatal suicidal behavior are central to preventing suicides. Epidemiologists and experts in suicide have described a number of specific characteristics that are closely associated with a heightened risk for suicidal behavior. Apart from demographic factors, such as age and sex, these characteristics include psychiatric, biological, social and environmental factors, as well as factors related to an individual's life history (Krug et al., 2002).

On July 28, 1999, the Surgeon General unveiled a blueprint to prevent suicide in the U.S. The document, entitled *The Surgeon General's Call To Action To Prevent Suicide,* outlines more than a dozen steps that can be taken by individuals, communities, organizations, and policymakers. Recognizing that mental and substance abuse disorders create the greatest risk for suicidal behavior, the recommendations attempt to prevent suicide and injuries from suicidal behavior by addressing these disorders in conjunction with other public health approaches (U.S. Public Health Service [USPHS], 1999). This Call to Action was an outgrowth of the 1996 World Health Organization document, *Prevention of Suicide: Guidelines for the Formulation and Implementation of National Strategies.* The WHO has increased its focus on global mental health and on prevention and treatment of mental disorders and risk factors for suicidal behavior.

Although traditionally suicide rates have been highest among the male elderly, rates among young people have been increasing to such an extent that they are now the group at

highest risk in a third of countries, in both developed and developing countries (WHO 2011). Mental disorders (particularly depression and alcohol use disorders) are a major risk factor for suicide in Europe and North America; however, in Asian countries impulsiveness plays an important role. Suicide is complex with psychological, social, biological, cultural and environmental factors involved (WHO, 2011) and may differ across countries.

Most current definitions of suicide rely on two elements: a precise outcome (death) and a prerequisite, the intention to die. In practice, however, determining intentionality can be difficult and sometimes impossible. Attempts to better define suicide have led to the concept of suicidal process: a sequence that goes from suicidal ideation (ideas/thoughts), to plans, then to attempts and ultimately, death, through a specific action (Bertolote & Wasserman, 2009).

***Epidemiology of suicide mortality*.**

Since its creation, WHO has compiled and disseminated data on mortality reported by its Member States, in accordance with its constitution. More than 120 countries report mortality data today. Data from developed countries (Europe, North America and a few countries in the western Pacific Region) are received on a regular basis. Most developing countries in Latin America, Asia and eastern Mediterranean region report on a less regular basis and very few countries in Africa report mortality data regularly to the WHO. Some of the 70 least developed countries, mostly in Africa, (but also Southeast Asia) do not maintain vital registration systems due to the lack of means to collect and process mortality data. And in contrast to data on completed suicide, there is a virtual absence of data on attempted suicide, thus forcing the reliance on local studies which vary greatly (Bertolote & Fleischmann, 2009).

The most recent suicide mortality data from WHO is shown in Figures 1.1. The global map shows the dearth of data in Africa, with only Egypt and Zimbabwe reporting to WHO.

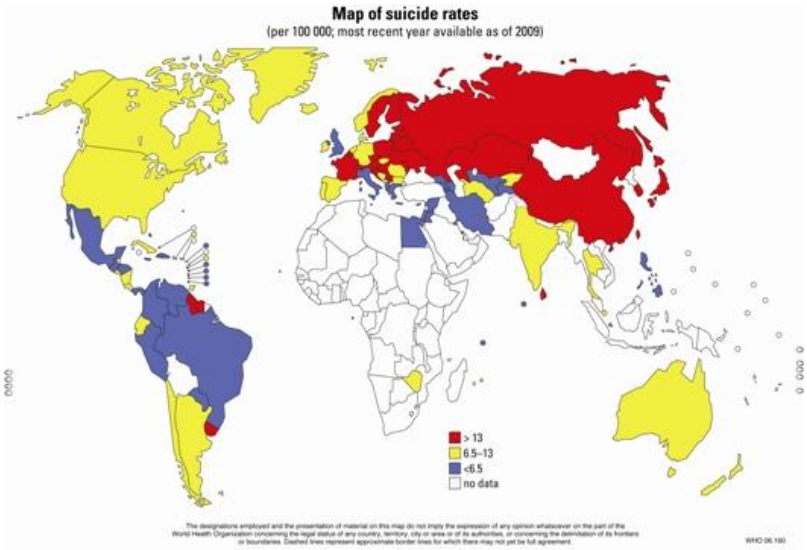

Figure 1.1 Map of Suicide Rates (WHO, 2009)

Figure 1.2 shows the change in distribution of suicide cases from 1950 to 2000. In 1950, 60% of the suicide cases occurred in those 45 years old and above. In 2000, 55% of suicide cases occurred among those under 45.

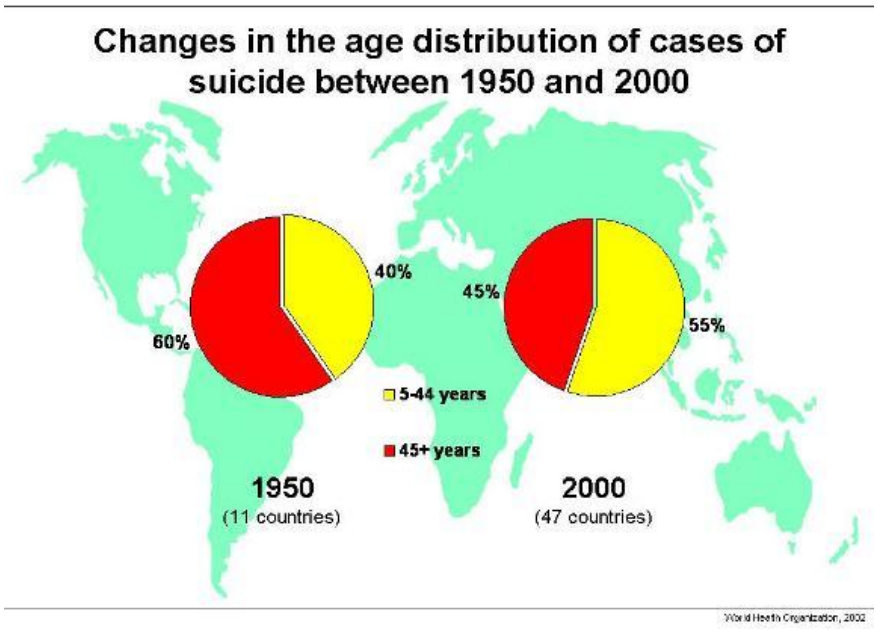

Figure 1.2 Changes in the age distribution of cases of suicide between 1950 and 2000 (WHO, 2002)

1.2 Suicide in sub-Saharan Africa

Research on suicidal behavior in Africa has been very scarce. Much of this dearth of research has been the result of political and economic instability that has plagued much of the continent for several decades (Schlebusch, Burrows & Vawda, 2009). In addition, cultural and religious diversity, plus traditional African beliefs, make it difficult to get a comprehensive understanding of the suicidal problem.

Generally, the prevalence of suicide tends to be higher in African countries in the east and south, compared to those in the north and west (Schlebusch et al., 2009). There are also considerable gender, ethnic and regional differences, plus differing cultural and religious views of mental illness and suicidal behavior (Kinyanda, E., Kizza R., Levin, J., Ndyanabangi, S., & Abbo, C., 2011; Schlebusch et al., 2009). In the past, suicidal behavior in Africa was thought to be rare, but more recent studies suggest that it is a substantial public health burden (Schlebusch

et al., 2009). This burden has been increased by the severe psychosocial stress associated with HIV/AIDS, an enormous public health burden in Africa. In addition, the stigma, discrimination, isolation, lack of support from family and friends, loss of parents or family members from HIV/AIDS adds to the burden of suicidal behavior (Schlebusch et al., 2009).

In Africa, a good understanding of the full burden of suicidal behavior is limited by a lack of systematic data collection and high-quality research. Political and socio-economic instability has resulted in a lack of accurate statistics on suicidal behavior, lack of research infrastructure and funds, limited death registers, a lack of expertise in suicide research, inadequate inter-African research collaboration, limited and outdated studies, a lack of standardized research designs and assessment instruments (resulting in mostly descriptive studies), an absence of follow-up studies and a dearth of multi-center studies, and low priority of research and prevention programs (Kinyanda E., Hjelmeland, H., Musisi, S., Kigozi, F. & Walugembe, J,. 2005).

Suicidal behavior in Africa is likely to be under-reported because of the aforementioned research and resource issues, socio-cultural religious and financial reasons, or misclassification as "undetermined" reason for death and accidental death. Suicidal behavior in most of Africa still carries negative cultural sanctions which skew reports of its occurrence, and such behavior still remains a crime in some countries, thereby encouraging perpetuation of non-reporting (Kinyanda et al., 2005; Omigbodun, O., Dogra, N., Esan, O., & Adedokun, B., 2008; Ovuga, E., Boardman, J., & Wassermann, D., 2005).

In an effort to obtain more information on youth health and behavior around the world, the World Health Organization and Centers for Disease Control and Prevention created the Global School-based Student Health Survey (GSHS), which has been implemented in over 40

countries (Global School-based Student Health Survey (GSHS). The GSHS datasets will be used in this study to gain an understanding of suicidal ideation, and behavioral risk factors among students in Botswana, Kenya, Tanzania, Uganda and Zambia. This information can be used to guide strategies for prevention.

1.3 Purpose of Study

The purpose of this study is to compare the prevalence and correlates of suicidal ideation among youths in five sub-Saharan African countries. This study will also address differences in prevalence and correlates of suicidal ideation between boys and girls in each country in an attempt to identify how these risk behaviors vary by gender across country settings. Previous studies in other countries have identified gender differences, mostly reporting a higher rate of suicidal ideation in girls than boys (Grunbaum, Kann, Kinchen, Ross, Hawkins, Lowry, et al., 2004; Krug et al, 2002; Reza, Mercy, & Krug 2001; USPHS, 1999). Though it has been reported that low to middle income countries experience higher rates of suicidal behavior, studies in this area have been mostly conducted in developed countries and there is a dearth of information about risk factors and how they may vary in developing countries such as those in sub-Saharan Africa.

Sub-Saharan Africa is a region with low-income developing countries with a history political and socio-economic instability and conflict. It is also a region ravaged by HIV/AIDS with many resulting orphans. The background of conflict, loss, family fragmentation, and poverty presents enhanced risk for suicidal behavior among youths; however, with little research conducted in sub-Saharan Africa, the effects of such factors have not been properly studied or identified. This study will analyze data from the GSHS student surveys in Botswana, Kenya,

Tanzania, Uganda and Zambia and identify the prevalence and correlates of suicidal ideation and how they vary across countries and gender so that these findings can be used to provide information regarding the epidemiologic characteristics of suicidal behavior in sub-Saharan Africa and to inform the development of successful interventions.

There is a growing and urgent need to focus on effective research and preventive efforts, with greater collaboration among African and non-African researchers being pivotal to this process. Major investment is needed, both for research and for preventive efforts. While short-term efforts contribute to an understanding of why suicide occurs and what can be done to prevent it, longitudinal research studies are necessary to fully understand the role of biological, sychosocial and environmental factors in suicide. There is also a great need for rigorous and long-term evaluations of interventions.

1.4 Research Questions

The specific research questions for this study are:

1. What are the prevalence and correlates of suicidal ideation among students in Botswana, Kenya, Tanzania, Uganda, and Zambia?
2. How do the prevalence and correlates of suicidal ideation vary among these sub-Saharan African countries?
3. Do the prevalence and correlates of suicidal ideation vary by gender among students in Botswana, Kenya, Tanzania, Uganda, and Zambia?

1.5 Sub-Saharan Africa and Background of Individual Countries:

Botswana, Kenya, Tanzania, Uganda and Zambia are all countries in sub-Saharan Africa as located as follows: Botswana is in southern Africa, north of South Africa; Kenya is located in Eastern Africa, bordering the Indian Ocean, between Somalia and Tanzania; Tanzania is also in Eastern Africa, bordering the Indian Ocean, between Kenya and Mozambique; Uganda in another country in Eastern Africa, west of Kenya, east of the Democratic Republic of the Congo; and Zambia is located in Southern Africa, east of Angola, south of the Democratic Republic of the Congo (CIA WorldFactbook, 2011).

Table 1.1 below outlines certain demographic, economic and health systems indicators for each country, including population characteristics, age structure, birth rate, infant mortality, life expectancy, poverty, HIV/AIDS prevalence, educational life expectancy, GDP per capita, density of physicians and nurses and midwives. All of the countries, except Botswana, share an extremely low GDP per capita, a high percentage (42%-49.9%) of population under 15 years old, a low urban population, and a high infant mortality rate. Botswana by far has the highest HIV/AIDS prevalence rate, but a much lower infant mortality rate compared to the other four sub-Saharan African countries. Zambia has an extremely high poverty rate (64%), followed by Kenya at 50%. School life expectancy is also lowest in Zambia at seven (7) years and highest in Botswana at 12 years. Uganda has the highest fertility rate at almost seven (7) children born per woman, followed by almost six (6) children in Zambia. The indicators of health systems resources, density of physicians and nursing and midwifery personnel show how under-resourced these sub-Saharan countries are in the health area. Physicians and nurses per population are woefully low in this region.

Table 1.1 Country Characteristics

	Botswana	Kenya	Tanzania	Uganda	Zambia
Population (July 2011)	2,065,398	41,070,934	42,746,620	34,612,250	13,881,336
Percentage of pop. under 15	33.9%	42.2%	42%	49.9%	46.7%
Median Age	22.3	18.9	18.5	15.1	16.5
Population growth rate	1.66%	2.46%	2.00%	3.576%	3.06%
Birth rate (per 1000 pop.)	22.3	33.54	32.64	47.49	44.1
Urban population percentage	61%	22%	26%	13%	36%
Life expectancy at birth	58.1	59.5	52.9	53.24	52.4
Infant Mortality Rate (per 1000 live births)	11.14	52.3	66.9	62.47	66.6
Total fertility rate (children born/woman)	2.5	4.19	4.16	6.69	5.98
HIV/AIDS adult prevalence rate (2009)	24.8%	6.3%	5.6%	6.5%	13.5%
Percent below poverty line	30.3%	50%	36%	35%	64%
School life expectancy (primary to tertiary)	12 years	11 years	9 years	11 years	7 years
GDP per capita (2010)	$14,000	$1,600	$1,400	$1300	$1,500
Physicians (per 10,000 pop.	4	1	<1	<1	1
Nursing and midwifes (per 10,000 pop.)	27	12	4	7	20

Adapted from the CIA WorldFactbook 2011 and WHO World Health Statistics, 2008

Sub-Saharan Africa is also the region most affected by HIV/AIDS and it is estimated that throughout the world, one in three people living with HIV are in sub-Saharan Africa (WHO, 2008). For every person living with HIV, many more are affected by the poor quality of life associated with caring for a sick family member. Children born to mothers affected by AIDS have a higher mortality rate than those whose mothers are healthy (Foster, 2006). Trauma from caring for sick parents leads to poor mental health and developmental problems for the children as well (Foster, 2006).

It is estimated that approximately 13 million children in the world have lost either one or both parents to AIDS, and more than 90% of these children are in sub-Saharan Africa (Krug et al, 2002). AIDS is responsible for producing orphans at such a rapid rate that, as a result, many communities cannot care for them. Since HIV/AIDS is a major problem in sub-Saharan Africa, along with malaria, hunger and poverty, many of the limited healthcare resources go towards treatment and prevention of those diseases and health concerns rather than other public health issues such as suicide and self-directed violence (Lett et al., 2006). Such limited mental health resources are, thus, likely to have serious adverse implications for suicidal behavior among young people in sub-Saharan Africa.

CHAPTER II
REVIEW OF LITERATURE

2.1 Suicide and Suicidal Ideation

Suicide is the third leading cause of death among those 15-24 in the U.S. and accounts for roughly 12.3% of all deaths within that age group annually (CDC, 2008). According to the CDC, "Suicidal behavior exists along a continuum from thinking about ending one's life ("suicidal ideation"), to developing a plan, to non-fatal suicidal behavior ("suicide attempt"), to ending one's life ("suicide")." Risk factors for suicidal behavior have been identified through research and placed into the following categories: psychiatric, biological, social, environmental and factors related to an individual's life history (Krug et al., 2002).

Some of the risk factors mentioned in the *World Report on Violence and Health* (Krug et al., 2002), and *The Surgeon General's Call to Action to Prevent Suicide* (USPHS, 1999) include:

- Major depression
- Mood disorders
- Personality and Conduct Disorders
- Hopelessness
- Alcohol and drug abuse
- Loss of a loved one
- A broken or disturbed relationship

- Social isolation
- Family history of suicide

The CDC has also identified the following risk factors for suicide among youth**:**

- History of previous suicide attempts
- Family history of suicide
- History of depression or other mental illness
- Alcohol or drug abuse
- Stressful life event or loss
- Easy access to lethal methods
- Exposure to the suicidal behavior of others
- Incarceration

(CDC, 2009).

Since most research of suicide risk factors has been obtained from the U.S., Western Europe, and other more developed countries, it is unknown if these risk factors exert similar effects in less developed countries or how the influence of such factors might vary from country to country (Hjelmeland et al,. 2008; Nock et al., 2008). Hjelmeland et al. (2008) compared suicidal behavior between Uganda and Norway and warned that psychiatric treatment of those from developing countries based on research results from Western countries may not be appropriate in the African context. These researchers called for "the urgent need for psychological and psychiatric research conducted in non-Western cultures." (Hjelmeland et al., 2008).

Nock et al. (2008) conducted a comprehensive study to estimate the cross-national prevalence of suicidal behaviors and to examine risk factors for these outcomes using

data from the World Health Organization World Mental Health (WMH) Survey Initiative. Their study used more consistent assessment methods that prior studies and represents the largest, most representative examination of suicidal behaviors ever conducted with 17 countries and sample size of 84,850. The results of this study showed a cross-national lifetime prevalence of suicidal ideation, plans and attempts of 9.2%, 3.1% and 2.7%, respectively. Across all countries, 60% of transitions from ideation to plan and attempt occur within the first year after onset of ideation. Consistent cross-national risk factors included being female, younger, less educated, unmarried and having a mental disorder. The researchers found an interesting finding in that the strongest risk factors in high-income countries were mood disorders, but in low-and middle-income countries, impulse control disorders were found to be the strongest (Nock et al., 2008).

2.2 Gender Differences in Suicide and Suicidal Ideation

Globally, girls and women have higher rates of suicidal ideation and behavior, but lower rates of suicide mortality than boys (Canetto, 2008). Suicide affects all youth, but some groups are at higher risk than others. Boys are more likely than girls to die from suicide. Of the reported suicides in the 10 to 24 age group in the U.S., 84% of the deaths were males and 16% were females. Girls, however, are more likely to report attempting suicide than boys (CDC, 2008). This gender paradox is most pronounced in industrialized, English-speaking countries such as Australia, Canada, Great Britain, New Zealand and the U.S. It is reported that females attempt suicide approximately two to three times as often as males during their lifetime (Krug et al 2002), but males account for 79.4% of all U.S. suicides (CDC, 2008) . In 2007, 18.7% of females and 10.3% of

males in grades 9-12 in the U.S. seriously considered suicide in the previous 12 months, and 9.3% of females and 4.6% of males reported attempting suicide at least once in the past 12 months (Eaton et al., 2008). If female adolescents do commit suicide, they tend to use less violent means than males (Epstein & Spirito, 2010). Grunbaum et al. (2004) analyzed data from the 2003 Youth Risk Behavior Survey (YRBS) and found that 12.8% of males and 21.3% of females had seriously considered suicide in the past 12 months. Research in the U.S. clearly depicts a gender difference among adolescent suicidal behavior. In contrast, research in China and India and other unindustrialized societies, reported that the rate of female suicides was higher than the male rate, which is uncommon among countries in North America and Western Europe where higher rates of suicide are found among males and females tend to have higher rates of suicidal ideation and attempts (Canetto, 2008; Grunbaum et al., 2004; Krug et al., 2002, Reza et al, 2001).

Epstein and Spirito (2010) examined gender differences in risk factors associated with suicidal ideation and suicide attempts. The major risk factors examined were substance use, aggression and victimization, and risky sexual behavior using data from the 2005 Youth Risk Behavior Surveillance. The results of the study demonstrated both gender-specific and gender-neutral risk factors for various risk factors of suicidality in a nationally representative sample of high school students in the U.S. Smoking cigarettes daily in the past 30 days increased the odds of considering suicide in girls. Early onset drinking was associated with considering suicide and planning a suicide attempt for girls only, while it was a risk factor for both males and females for suicide attempts. Other drug use (sniffing glue, injecting drugs) showed associations with all types of suicidality

across gender. Carrying a weapon and fighting (in school for boys and outside of school for girls) were consistently related to suicidal ideation and attempts. In addition, having had sex before age 13 was related to making a plan to attempt suicide and actually attempting suicide across gender (Epstein & Spirito, 2010).

Another recent study looked at risk factors and suicidal ideation and attempts in an urban Chinese sample of adolescents using a modified version of the YRBS questionnaire. Juan, Xiao-Juan, Jia-Ji, Xin-Wang and Liang (2010) found several gender-related differences. Females were significantly more like to report suicidal ideation than males among those who felt sad or hopeless, but males were more likely to report suicidal attempts than females among those who did not feel sad or hopeless. Physical fighting was associated with suicidal attempts, but not with suicidal ideation for females. Ever having sexual intercourse and lifetime marijuana use were associated with suicidal attempts for males (Juan et al., 2010).

The majority of young people who are involved in suicidal behaviors have been diagnosed with a psychiatric disorder, such as depression or alcohol/substance abuse (Juan et al., 2010; King et al., 2001). Clinical research and literature have shown that risk factors for suicidal behavior differ across gender in adolescent psychiatric populations (Gould, King, Greenwald et al., 1998). The research on gender differences for suicidality shows suicide prevention programs should take into account risk factors related to suicidality for both genders.

2.3 Suicide and Suicidal Ideation Among Adolescents in Sub-Saharan Africa

Research on the broad concept of suicidal behavior in sub-Saharan Africa has been sparse; however, the studies which have taken place indicate that it is a significant problem and large in scope. Suicide is a criminal offense in many countries in Africa and highly stigmatized (Ovuga et al., 2005).

Suicidal behavior in adolescence continues to increase as a public health concern and even with the dearth of research and studies, emerging data seems to suggest that it may be of even greater magnitude than in Western countries (Kinyanda et al., 2011). A recent study by Kinyanda et al. (2011) examined the prevalence and risk factors of adolescent suicidality in four districts of rural northeastern Uganda. Among the 1492 respondents, aged 3-19, lifetime suicidality was 6.1%. The study also found a prevalence of deliberate self-harm of 1.7% which was found comparable to that reported in the WHO/EURO Multi-Centre Study, but lower than that reported in the YRBS in the U.S. at a rate of 8.5%. The ecological factor of district of residence was independently associated with suicidality. The socioeconomic factors that were significantly associated with suicidality were female gender, age group (rates increasing with age), educational attainment (highest in those with no formal education), living arrangements (higher in those not living with both parents), and low earnings. Kinyanda et al. (2011) point out that studies from both the West and from developing countries have shown that youth suicidal behavior was more common among females than males and among older youth. The psychiatric factors associated with suicidality were depressive disorder syndromes, psychotic disorder syndromes and anxiety disorder syndromes. This finding was parallel to finding in the West, except for alcohol and substance abuse disorder syndromes which

were not associated with an increased risk for suicidal behavior. Psychosocial factors associated with adolescent suicidality in this study included exposure to war trauma and orphanhood.

Ovuga et al. (2005) conducted a survey to measure suicidal ideation in two districts of Uganda (Adjumani and Bugiri Districts). They found that suicidal ideation was almost three times higher in the Adjumani district, which is considered to be socially disadvantaged. It is important to note that the Adjumani district is in Northern Uganda and has been directly impacted by armed conflict. Much of the population from that region had been exiled to Sudan in 1979 and were not allowed to return to their home district until 1986 (Ovuga et al., 2005). Ovuga et al. (2005) suggest that the long term armed conflict and war, along with economic hardships and exile appear to have resulted in increased prevalence of mental disorders and suicidal ideation in the region (Ovuga et al, 2005). In addition, the researchers also suggested that the prevalence of suicidal ideation in both districts is most likely higher than what is reported in these surveys due to stigma and taboo associated with suicide.

As mentioned by Krug and colleagues (2002), attempted suicide is a punishable offense in many developing countries and therefore hospitals do not always report these cases. In Uganda, suicide is illegal and viewed by the majority as “taboo” (Hjelmeland, et al., 2006; Ovuga et al., 2005). The stigma tied so closely to suicide causes some family members of victims to cover up the suicide and forego the normal burying ritual (Hjelmeland et al., 2006), making it difficult for health officials to accurately document suicide cases. There are reportedly no accurate statistics on suicide in Uganda

(Hjelmeland et al., 2006; Krug 2002), but healthcare workers recognize that suicide is a problem that faces their community (Hjelmeland et al., 2006).

Very little is documented regarding suicide in African countries (WHO, 2009). In fact, out of 97 countries with recent suicide statistics available through WHO, only two were in Africa (Zimbabwe and Egypt) as also shown in Figure 1.1. There is a clear need for more information about these African countries. Without proper research being carried out regarding suicide and suicidal ideation in sub-Saharan African countries, there is no evidence to suggest that the same risk factors which apply to youth in the U.S. and Europe also apply to the youth in such countries. Furthermore, if limited information is available regarding suicide, then even less information is available regarding suicidal ideation, planning and attempts.

A few studies on suicidal behavior among youth in sub-Saharan Africa have been conducted using the GSHS. Swahn, Bossarte, Eliman, Gaylor and Jayaraman (2010) conducted analyses using the GSHS datasets for Zambia, Kenya, Botswana, and Uganda and used YRBS data from the U.S. to examine prevalence and correlates of physical fighting and suicidal ideation in these countries. Swahn et al. (2010) discovered that alcohol use and bully victimization were associated with suicidal ideation in all countries. Zambia had the highest prevalence of involvement in both physical fighting and suicidal ideation (18.5%), followed by Kenya (16.4%), Botswana (12.7%), U.S.A. (8.8%), and Uganda (8.6%). This study emphasizes that there is a dire need for more research on this topic in sub-Saharan Africa.

Rudatsikira, Muula, Siziya and Twa-Twa (2007a) reported on suicidal ideation and associated factors among students in rural Uganda using the GSHS Rural dataset.

The results indicated that male subjects were less likely to contemplate suicide than females. Feelings of loneliness and being bullied were positively associated with suicide ideation for both males and females. Worry and alcohol consumption were reported to have been positively associated with suicidal ideation among females only.

Rudatsikira, Siziya and Muula (2007b) examined suicidal ideation and associated factor among school-going adolescents in Zimbabwe using existing data obtained from the Zimbabwe GSHS conducted in 2003. The authors point out that during this time, Zimbabwe was experiencing poor socio-economic conditions and no similar study had ever been done before in Zimbabwe. The results indicated a prevalence of suicidal ideation of 21.6%. Males were less likely to have suicidal ideation than females. Worrying, feeling lonely, cigarette smoking and drinking alcohol were associated with suicidal ideation.

Muula, Kazembe, Rudatsikira, and Siziya (2007) also used the GSHS datasets to research suicidal ideation and associated factors among students in Zambia. Of all the students who participated in the survey, 32.2% reported suicidal ideations in the past 12 months. Prevalence of suicidal ideation among males and females was similar. The study found that lifetime experience of being drunk, cannabis use, being less than 14 years old, worrying so much that one could not sleep, and feeling so sad and hopeless that they could not do usual activities all had a positive association with suicidal ideation (Muula et al., 2007). Gender was not significantly associated with suicide ideation, while having felt lonely was negatively associated with the outcome.

Omigbodun et al. (2008) were the first to examine rates of self-reported suicidal ideation and suicide attempt and associated psychosocial factors in urban and rural youth

aged 10-17 years in southwest Nigeria. The researchers hypothesized that rates would be comparable with those of other developing countries and higher than developed countries and that suicidal behavior would be associated with poverty, sexual behaviors, violence and psychoactive substance use. A total of 1429 youth completed the Nigeria version of the Global School Health Questionnaire (GSHQ) and the Diagnostic Predictive Scale (DPS) for youths (suicidal behavior questions) in a school setting (Omigbodun et al,. 2008). Over 20% of the students reported suicidal ideation and 12% reported that they had attempted suicide in the last year. Adolescents in urban areas, from polygamous or disrupted families had higher rates of suicidal behavior. Sexual abuse, being physically attacked and engaging in physical fights in the last 12 months were significantly related to suicidal ideation. Working to support their families, going hungry, having parents who were divorced or separated and having sexual intercourse in the last 12 months were also significantly associated to suicidal ideation. (Omigbodun et al., 2008). There was no gender difference in the rates of suicidal ideation and attempts, but there were some gender differences in significant predictors for suicidal behavior. Drinking alcohol and having to go hungry were significant predictors for male suicide attempt while sexual abuse or sexual activity and unstable family life were significant predictors for female youth. Physical attack was a significant predictor for suicidal behavior in both males and female youth. Omigbodun et al. (2008) identified that the prevalence of suicidal behavior identified in this study were higher in comparison to studies in developed countries (2-3.5% in studies from Europe and about 9% in the U.S.).

2.5 Summary

Suicide ideation has been identified by the WHO as a significant social and mental health concern. The few studies which have been conducted on suicidal behavior in sub-Saharan Africa indicate that it is a public health problem among adults and youth which deserves immediate attention. There have been numerous studies conducted in Western countries regarding risk factors for suicidal behavior, but it cannot be assumed that those same risk factors will apply to youth in these five sub-Saharan countries. Therefore, it is important for more studies to analyze the prevalence, correlates of suicidal ideation in sub-Saharan countries so that an accurate assessment of the country-specific and regional situation may be conducted and appropriate action taken. Studying the whole continuum of suicidal behavior is particularly important in adolescents because both suicidal ideation and suicide attempts have been found to be association with the risk for completed suicide (Omigbodun et al., 2008).

Omigbodun et al. (2008) pointed out that although Nigerian adolescents have one of the highest rates of suicidal ideation and attempts, it is unclear whether these high rates are linked with actual suicides. Research in this area is limited and the criminalization of suicide attempts in Nigeria and in other sub-Saharan countries may hinder reporting and assistance (Adinkrah, 2011). The researchers suggested that adolescents with high-risk factors need to be identified and counseled as preventive measures in the face of limited resources. The limited number of mental health professionals should work with schools to address education and counseling in this area (Omigbodun, 2008).

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Relevance of the Study

The aim of this study is to examine the prevalence and correlates of suicidal ideation among youth in Botswana, Kenya, Tanzania, Uganda and Zambia, all developing countries in sub-Saharan Africa. The findings thereof may assist to raise awareness of the problem of suicidal behavior and promote research, resources and prevention efforts in the mental health area in these under-resourced and developing countries.

CHAPTER III
METHODS AND PROCEDURES

3.1 Data Source

This study is based on data obtained from the Global School-Based Student Health Survey (GSHS) conducted in Botswana (N=2197; 2005), Kenya (N=3691; 2003), Tanzania (N=2176; 2006), Uganda (N=3215; 2003) and Zambia (N=2257; 2004). The GSHS was developed and supported by the World Health Organization (WHO) in collaboration with the United Nations Children's Fund (UNICEF), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and with technical assistance from the CDC (WHO, 2011).

The purpose of the GSHS is to provide data on health behaviors and relevant risk and protective factors among students across all regions served by the United Nations. Country specific questionnaires, fact sheets, public-use data files, documentation and reports are publicly available from the CDC and WHO and have been described elsewhere (Muula et al., 2007; Rudatsikira et al., 2007a; Swahn et al., 2010). The GSHS is a self-administered questionnaire, distributed primarily to students who are 13-16 years of age through their school. The GSHS uses a standardized scientific sample selection process, common school-based methodology, and a combination of core question modules, core-expanded questions, and country-specific questions.

To administer the GSHS, a two-stage cluster sample design was used. The first stage selected schools with probability proportional to enrollment size; the second stage randomly selected classes and all students in the selected classes were eligible to participate in the survey. The numbers of study participants and response rates, as well as gender distribution, are provided in Table 3.1 below.

Table 3.1 GSHS Country Characteristics

	Botswana	Kenya	Tanzania	Uganda	Zambia
Year	2005	2003	2006	2003	2004
Total Sample	2197	3691	2176	3215	2257
Type of Representation	National	National	Dar es Salaam Region	National	National
School Response Rate	100%	96%	100%	90%	94%
Student Response Rate	95%	87%	87%	76%	75%
Overall Response Rate	95%	84%	87%	69%	70%
Boys (Wtd. %)	45.0%	48.7%	47.9%	51.2%	48.9%
Girls (Wtd. %)	55.0%	51.3%	52.1%	48.8%	51.1%

This study conducted secondary analysis of the publicly available data files for Botswana, Kenya, Tanzania, Uganda and Zambia to examine 13 potential risk factors (i.e. hunger, current alcohol use, problem drinking, bullying victimization, loneliness, sadness, worrying, no friends, missed school, illicit drug use, physical fights, physical attacks, and early sexual initiation) to determine their association with suicidal ideation among boys and girls in the schools of Botswana, Kenya, Tanzania, Uganda and Zambia. Institutional Review Board approval was obtained at Georgia State University to conduct these analyses. Botswana, Kenya, Tanzania, Uganda and Zambia were selected for these analyses because each had one complete national data file representing the entire country

(except for Tanzania which was a regional data file) with the necessary question regarding suicidal ideation.

3.2 Measures

The risk factors included in the analyses for this study were hunger, current alcohol use, problem drinking, bullying victimization, loneliness, sadness, worrying, no friends, missed school, illicit drug use, physical fights, physical attacks, and early sexual initiation) which have been identified as important for suicidal ideation in previous literature. These 13 risk factors were included in the core questionnaire for all five countries. Variable names and the wording of questions were identical (except as noted below) for all national and regional surveys. The following variables were obtained directly from the GSHS surveys for use in this study:

Outcome variables

Suicidal Ideation	Percentage of students who seriously considered attempting suicide during the past 12 months.

Risk factors

Hunger	Students who went hungry most of the time or always during the past 30 days because there was not enough food in their home.
Current Alcohol Use	Students who had at least one drink containing alcohol on one or more days during the past 30 days.
Problem Drinking	Students who ever had a hang-over, felt sick, got into trouble with family or friends, missed school, or got into fights, as a result of drinking alcohol.
Bullying Victimization	Students who were bullied on one or more days in the past 30 days.
Sadness	Students who felt so sad or hopeless almost every day for two weeks or more in a row that they stopped doing their usual activities during the past 12 months.
Lonely	Students who felt lonely during the past 12 months
Worrying	Students who most of the time or always felt so worried about

	something that they could not sleep at night during the past 12 months.
No Friends	Students who have no close friends.
Missed School	Students who missed classes or school without permission on one or more days during the past 30 days.
Illicit Drug Use	Students who used drugs during their life.
Physical Fights	Students who were in a physical fight one or more times during the past 12 months
Physical Attacks	Students who were physically attacked one or more times during the past 12 months.
Early Sexual Initiation	Students who had sexual intercourse for the first time before age 13.

The drug use variable included in the analyses reflected different types of drugs commonly used within a country. In Botswana, the drugs provided as examples in the question were glue, benzene, marijuana, cocaine or mandrax. In Kenya, the drugs listed were marijuana, bhangi, mushrooms, speed or cloud. In Tanzania, the drugs asked about were bang or cocaine. In Uganda, the drugs were marijuana ("njaga" or "bangi") or opium ("njave") or sniffed aviation fuel. In Zambia, the question asked about "daga". The physical attacks variable question was asked in all five countries, but data was only available for Botswana and Tanzania.

Responses to these variable questions were dichotomized to indicate any exposure or involvement to the particular risk factor versus none for each of the 13 variables. Such dichotomized responses were also available in the data files for each country. Table 3.2 below outlines each measure and its prevalence across the five countries. Table 3.3 below outlines each risk factor and its prevalence across the five countries, stratified by gender.

Table 3.2 Variables Included in the Analyses and their Prevalence Across Botswana, Kenya, Tanzania, Uganda and Zambia

Variable Name	Botswana N=2197 Wtd%	Kenya N=3691 Wtd%	Tanzania N=2176 Wtd%	Uganda N=3215 Wtd%	Zambia N=2257 Wtd.%
Hunger	14.0%	14.7%	3.76%	9.33%	28.7%
Current Alcohol Use	22.5%	17.9%	5.11%	15.3%	42.6%
Problem Drinking	18.1%	30.6%	13.9%	21.5%	45.1%
Bullying Victimization	53.4%	57.7%	25.2%	45.9%	63.1%
Sadness	42.3%	48.9%	23.7%	41.9%	53.3%
Lonely	17.3%	17.5%	6.05%	11.3%	24.1%
Worrying	19.7%	15.5%	3.81%	11.7%	26.4%
No Friends	14.1%	11.7%	8.30%	10.4%	15.7%
Missed School	24.7%	40.0%	33.6%	37.4%	58.5%
Illicit Drug Use	9.15%	15.2%	5.40%	9.50%	36.7%
Physical Fights	47.2%	49.8%	40.8%	35.2%	51.7%
Physical Attacks	55.9%	---	56.6%	---	---
Early Sexual Initiation	8.91%	22.6%	9.89%	11.1%	26.3%
Suicidal Ideation	23.1%	27.9%	11.2%	19.6%	31.9%

Table 3.3. Variables and Their Prevalence Among Boys And Girls Across Five sub-Saharan African countries

Variable Name	Botswana N=2197 Wtd%		Kenya N=3691 Wtd%		Tanzania N=2176 Wtd%		Uganda N=3215 Wtd%		Zambia N=2257 Wtd.%	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Hunger	15.3%	12.7%	14.1%	15.2%	4.25%	3.15%	9.00%	9.48%	26.7%	30.6%
Current Alcohol Use	24.1%	21.1%	20.5%	15.0%	6.18%	3.94%	17.2%	13.3%	38.9%	45.5%
Problem Drinking	20.1%	16.3%	31.2%	29.9%	15.5%	12.0%	21.6%	20.7%	40.8%	48.7%
Bullying Victimization	54.3%	52.6%	57.6%	57.6%	25.6%	24.6%	48.0%	43.4%	60.4%	65.2%
Sadness	40.3%	44.3%	49.4%	48.3%	26.2%	21.7%	40.2%	43.9%	51.6%	53.7%
Lonely	16.9%	17.7%	16.6%	18.0%	6.38%	5.79%	11.3%	11.4%	22.4%	25.8%
Worrying	19.9%	19.4%	15.8%	15.3%	4.51%	3.05%	11.1%	12.4%	25.0%	27.7%
No Friends	13.7%	14.7%	10.9%	12.3%	7.73%	8.84%	9.17%	11.6%	14.9%	15.6%
Missed School	30.1%	19.7%	42.2%	37.7%	33.5%	33.1%	39.5%	34.9%	58.1%	57.8%
Drug Use	13.9%	4.62%	15.8%	14.2%	6.49%	4.38%	10.1%	8.40%	33.8%	39.2%
Physical Fights	53.1%	41.5%	52.4%	47.2%	45.4%	36.7%	37.9%	31.9%	49.3%	54.0%
Physical Attacks	56.7%	55.4%	---	---	59.6%	53.6%	---	---	--	--
Early Sexual Initiation	15.3%	3.70%	31.8%	13.9%	15.7%	5.55%	15.8%	5.98%	30.3%	20.7%
Suicidal Ideation	21.7%	23.9%	27.5%	28.3%	11.65	11.0%	17.2%	22.1%	31.4%	31.5%

3.3 Statistical Analysis

For variables where the amount of missing data exceeded 5 percent, the commonly used missing-indicator method was applied (Cheng, Gau, Chen, Chang & Chang, 2004; Miettinen, 1985). In this method, a dummy category is created to reflect the missing data and thereby including nearly all participants in the analyses rather than omitting them using the default list-wise deletion used in the logistic regression computation. While no statistical findings or associations are reported on the missing data, the odds ratio would be interpreted as the risk for the outcome for those with missing data relative to the reference category. These complex multi-staged surveys were analyzed using the SAS 9.1 and SUDAAN 10 statistical software packages to accommodate the sampling design and produce weighted estimates.

Bivariate association analyses were performed between gender, the 13 risk factors and suicidal ideation among all students in each country. Multivariate logistic regression analyses adjusted for sex were then computed to determine the associations between each of the risk factors and the outcome variable, suicidal ideation for each country. In addition, multivariate logistic regression analyses were computed and stratified by gender between the potential risk factors among students across the five countries. All 13 variables included in the bivariate analysis, whether significant or not, were also included in the multivariate to enable a comparison of each variable across the countries.

CHAPTER IV
RESULTS

4.1 Prevalence of suicidal ideation

The prevalence of the outcome variable across the country samples is provided in Table 4.1. Zambia had the highest prevalence of suicidal ideation (31.9%) among all students, followed by Kenya (27.9%), Botswana (23.1%), Uganda (19.6%) and Tanzania (11.2%).

Table 4.1 Prevalence of Suicidal Ideation

	Botswana		Kenya		Tanzania		Uganda		Zambia	
All Students	23.1%		27.9%		11.2%		19.6%		31.9%	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Stratified by sex	21.7%	23.9%	27.5%	28.3%	11.6%	11.0%	17.2%	22.1%	31.4%	31.5%

Prevalence trends in suicidal ideation in each country are shown in Figure 4.1 below.

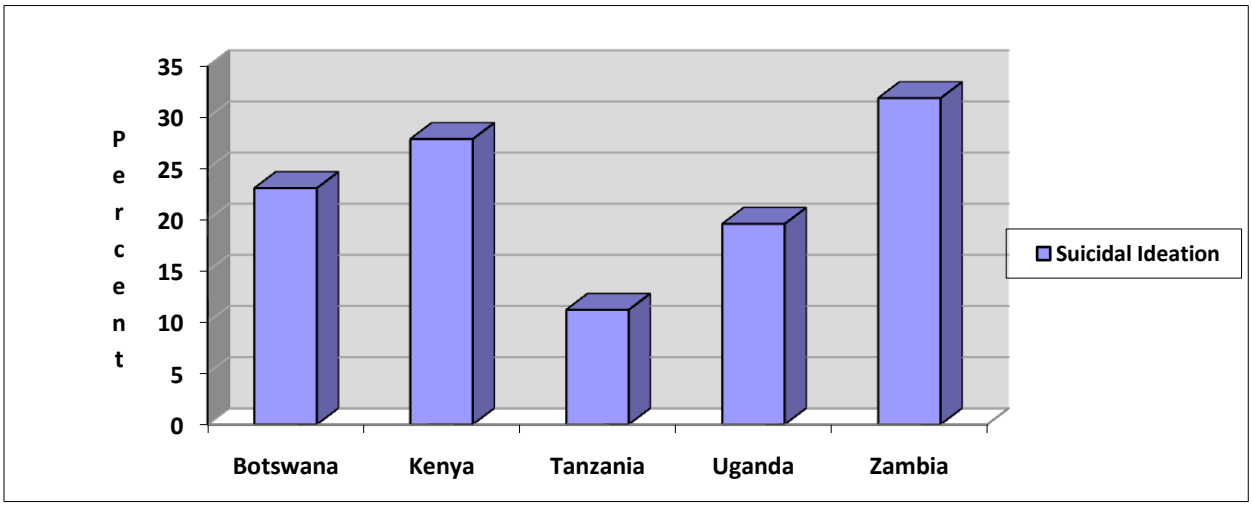

Figure 4.1 Prevalence of suicidal ideation among students, by country.

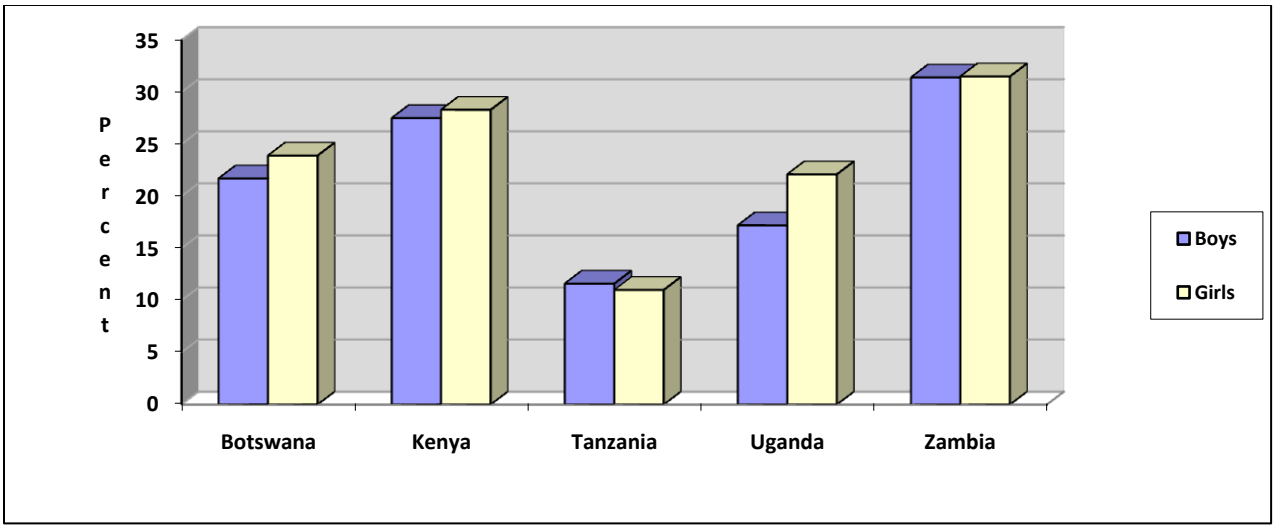

Figure 4.2 Prevalence of suicidal ideation among boys and girls, by country.

Table 3.3 and Figure 4.2 show the prevalence of suicidal ideation among boys and girls. Although some differences between boys and girls appear in the trends for each country, the bivariate associations shown in Table 4.2 only resulted in a significant association between sex and suicidal ideation in Uganda (OR=0.73, 95% CI: 0.59-0.92).

Comparisons of the risk factors across countries show that Zambia had the highest prevalence in all 13 risk factors (see Table 3.2), with bullying victimization the highest at 63.1%, followed by missed school (58.5%), sadness (53.3%) and physical fights (51.7%), problem drinking (45.1%), current alcohol use (42.6%0, drug use (36.7%), hunger (28.7%), worrying (26.4%), early sexual initiation (26.3%), loneliness (24.1%), and no friends(15.7%). Tanzania had the lowest prevalence for hunger, current alcohol use, problem drinking, bullying victimization, sadness, feeling lonely, worrying, having no friends, and drug use. Missed school and early sexual initiation had the lowest prevalence in Botswana, while physical fighting was lowest in Uganda. Prevalence for physical attacks was very high in Botswana (55.9%) and Tanzania (56.6%) where that variable was available. Boys and girls in Zambia also had the

highest percentages across all risk factors, except for early sexual initiation among boys in Zambia (see Table 3.3).

4.2 Correlates of Suicidal Ideation Among All Students Across Countries

Bivariate associations were computed for sex and all 13 risk factors (hunger, current alcohol use, problem drinking, bullying victimization, loneliness, sadness, worrying, no friends, missed school, illicit drug use, physical fights, physical attacks, and early sexual initiation) and are shown in Table 4.2. As noted previously, sex was significantly associated with suicidal ideation only in Uganda. In previous studies, gender was not significantly associated with suicide ideation.

Current alcohol use, problem drinking, being bullied and worrying were significantly associated with suicidal ideation across all five countries. Sadness and feeling lonely were significant in all countries except for Zambia. Illicit drug use was significantly associated with suicidal ideation in all countries except Botswana, while physical fighting was significant in all countries except Tanzania. Hunger was significant in Botswana, Kenya and Uganda and early sexual initiation was significant in Kenya, Tanzania and Uganda. Having no friends was only significantly associated with suicidal ideation in Uganda. Uganda was the only country to show significant associations between all risk factors and sex and suicidal ideation.

The multivariate logistic regression analyses of the associations between the 13 risk factors and suicidal ideation among students across the five sub-Saharan countries are shown in Table 4.3. Although bivariate associations were computed for all correlates as shown in Table 4.2, logistic regressions were still conducted for all risk factors/correlates with suicidal ideation for all countries to enable comparison of associations and results.

Sadness was significantly associated with suicidal ideation in Kenya (Adj. OR=2.45, 95% CI: 1.76-3.42), Tanzania (Adj. OR=3.06, 95% CI:1.75-5.37 and Uganda (Adj. OR=2.65, 95% CI:1.85-3.79). Feeling lonely was significantly associated with the outcome variable in Kenya (Adj. OR=2.23, 95% CI:1.27-3.92) and Tanzania (Adj. OR=2.40, 95% CI:1.10-5.20). Hunger (Adj. OR=1.78, 95% CI:1.16-2.73) problem drinking (Adj. OR=1.73, 95% CI:1.05-2.85) and worrying (Adj OR=1.57, 95% CI:1.07-2.31) were associated with suicidal ideation among only Botswana students. Current alcohol use was significant only in Tanzania (Adj.OR=2.69, 95% CI: 1.23-5.86). Finally, bullying victimization (Adj. OR=1.85, 95% CI:1.18-2.88) and physical fighting (Adj OR=1.60, 95% CI: 1.07-2.39) were significantly associated with suicidal ideation only in Kenya.

Sadness and feeling lonely were the most commonly associated correlates of suicidal ideation among students across these sub-Saharan countries. Gender, having no friends, missing school, illicit drug use, physical attacks and early sexual initiation were not significantly associated with suicidal ideation among students in any of the countries.

Muula et al. (2007) found that lifetime experience of being drunk, cannabis use, being less than 14 years old, worrying so much that one could not sleep, and feeling so sad and hopeless that they could not do usual activities all had a positive association with suicidal ideation (Muula et al., 2007).

4.3 Correlates of suicidal ideation among all students by gender across countries

Logistic regression analyses of the associations between the risk behaviors and suicidal ideation among students stratified by gender are shown in Table 4.4. Once stratified by sex, sadness was still significantly associated with suicidal ideation among boys and girls in Kenya,

Tanzania and Uganda. Feeling lonely was significantly associated with suicidal ideation among boys and girls in Kenya, but among girls only in Tanzania. Current alcohol use was found to be a significant correlate among Tanzania and Zambia girls only. Problem drinking showed significance among Botswana boys and Uganda girls. Hunger was found to be significantly associated with the outcome variable among Botswana boys only; Bullying victimization was found to be significantly associated with suicidal ideation among only boys in Kenya. Worrying was found to only be significant among Tanzanian boys, with no significant findings for Botswana boys or girls, contrary to the results among all students there. While missed school was not significantly associated among all students, once stratified by gender, missed school was significant among Kenyan girls. Similarly, drug use was found to be significantly associated with suicidal ideation among boys in Zambia, while having shown no association in the multivariate analysis among all students across the five countries (see Tables 4.3 and 4.4).

Table 4.2 . Bivariate Associations Between Demographic Characteristics and Risk Factors and Suicidal ideation Among Students Across Five sub-Saharan African countries

Risk Factors	Botswana		Kenya		Tanzania		Uganda		Zambia	
	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)
Boys	10.5	0.88 (0.67-1.16)	13.4	0.96 0.74-1.26	5.18	1.06 0.82-1.38	8.89	**0.73 0.59-0.92**	17.0	1.00 (0.76-1.30)
Girls	12.3	1.00	14.5	1.00	6.13	1.00	10.7	1.00	14.4	1.00
Hunger	4.40	**1.67 (1.16-2.41)**	4.82	**1.55 1.15-2.08**	0.43	1.10 0.51-2.38	2.56	**1.63 1.22-2.18**	9.52	1.11 (0.83-1.49)
Current Alcohol Use	6.01	**1.58 (1.36-1.83)**	5.61	**1.76 1.43-2.23**	1.18	**3.36 1.95-5.80**	3.97	**1.74 1.35-2.24**	16.9	**2.58 (1.88-3.54)**
Problem Drinking	5.61	**1.69 (1.44-1.99)**	10.0	**1.61 1.30-1.99**	2.64	**2.22 1.56-3.15**	6.24	**2.11 1.74-2.56**	17.3	**1.85 (1.43-2.39)**
Bullying Victimization	14.2	**1.89 (1.52-2.35)**	18.5	**2.23 1.69-2.94**	4.53	**2.31 1.68-3.16**	10.4	**1.66 1.30-2.13**	22.2	**1.70 (1.25-2.31)**
Sadness	10.7	**1.27 (1.05-1.53)**	16.7	**1.94 1.49-2.52**	5.16	**3.31 2.46-4.44**	11.7	**2.60 2.00-3.38**	17.0	1.02 (0.83-1.27)
Lonely	5.40	**1.72 (1.28-2.31)**	6.65	**2.16 1.58-2.95**	1.73	**3.94 2.53-6.15**	3.64	**2.21 1.78-2.76**	8.22	1.18 (0.96-1.46)
Worrying	6.45	**1.93 (1.47-2.54)**	5.45	**2.01 1.51-2.68**	0.81	**2.35 1.20-4.58**	3.68	**2.17 1.64-2.87**	9.75	**1.45 (1.19-1.76)**
No Friends	3.58	1.17 (1.00-1.36)	3.73	1.23 0.94-1.62	1.12	1.30 0.79-2.13	2.77	**1.62 1.30-2.02**	5.24	1.16 (0.81-1.65)
Missed School	8.16	**2.04 (1.45-2.86)**	12.3	**1.42 1.20-1.68**	4.53	1.42 0.93-2.19	8.51	**1.38 1.11-1.73**	18.6	1.16 (0.89-1.51)
Illicit Drug Use	2.36	1.26 (0.93-1.71)	5.32	**1.82 1.37-2.43**	1.60	**4.41 2.37-8.21**	2.94	**2.24 1.62-3.09**	14.2	**1.77 (1.31-2.39)**
Physical Fights	12.7	**1.53 (1.19-1.96)**	16.4	**1.86 1.58-2.18**	5.32	1.39 0.99-1.94	8.63	**1.67 1.35-2.06**	18.5	**1.50 (1.21-1.86)**
Physical Attacks	15.5	**1.93 (1.44-2.58)**	--	--	6.68	1.18 0.78-1.78	--	--	--	--
Early Sexual Initiation	2.16	1.34 (0.94-1.90)	6.74	**1.39 1.07-1.81**	2.15	**2.98 1.59-5.59**	2.82	**1.79 1.30-2.48**	8.27	1.44 (0.79-2.60)

Table 4.3 Multivariate Logistic Regression Analyses of the Associations between Risk Factors and Suicidal Ideation Among Students Across Five Sub-Saharan African Countries

Risk Factors	Botswana	Kenya	Tanzania	Uganda	Zambia
	Adj. OR (95% CI)	Adj. OR (95% CI)	Adj. OR (95% CI)	Adj. OR (95% CI)	Adj. OR (95% CI)
Hunger	**1.78 (1.16-2.73)**	0.79 (0.46-1.36)	1.46 (0.52-4.14)	0.96 (0.58-1.61)	0.58 (0.27-1.26)
Current Alcohol Use	1.37 (0.95-1.97)	1.36 (0.86-2.14)	**2.69 (1.23-5.86)**	0.81 (0.55-1.21)	2.36 (0.70-7.87)
Problem Drinking	**1.73 (1.05-2.85)**	0.92 (0.57-1.51)	1.01 (0.57-1.79)	1.47 (0.99-2.20)	1.93 (0.74-5.07)
Bullied	1.06 (0.73-1.55)	**1.85 (1.18-2.88)**	1.30 (0.91-1.85)	1.19 (0.79-1.80)	1.04 (0.61-1.78)
Sadness	1.21 (0.80-1.85)	**2.45 (1.76-3.42)**	**3.06 (1.75-5.37)**	**2.65 (1.85-3.79)**	1.27 (0.67-2.40)
Lonely	1.57 (0.98-2.50)	**2.23 (1.27-3.92)**	**2.40 (1.10-5.20)**	1.56 (0.93-2.62)	0.71 (0.25-2.00)
Worrying	**1.57 (1.07-2.31)**	1.71 (0.95-3.08)	1.21 (0.63-2.32)	1.51 (0.96-2.36)	0.86 (0.42-1.75)
No Friends	1.19 (0.61-2.33)	0.96 (0.66-1.41)	0.98 (0.42-2.29)	1.27 (0.67-2.40)	1.03 (0.47-2.26)
Missed School	1.30 (0.79-2.14)	1.43 (0.99-2.06)	1.12 (0.67-1.86)	1.12 (0.84-1.48)	0.71 (0.39-1.29)
Illicit Drug Use	0.83 (0.35-1.95)	1.08 (0.47-2.45)	1.51 (0.42-5.46)	1.26 (0.62-2.57)	1.52 (0.48-4.83)
Physical Fights	0.98 (0.65-1.50)	**1.60 (1.07-2.39)**	1.13 0.62-2.06	1.22 0.91-1.63	1.38 (0.78-2.44)
Physical Attacks	1.41 (0.96-2.09)	--	0.91 0.55-1.51	--	--
Early Sexual Initiation	1.44 (0.63-3.26)	1.13 0.70-1.83	1.56 0.58-4.18	1.60 1.00-2.56	1.02 (0.49-2.14)

Table 4.4 Multivariate Logistic Regression Analyses of the Associations between Risk Factors and Suicidal Ideation Among Students Across Five sub-Saharan African Countries, Stratified by Gender

Risk Factors	Botswana		Kenya		Tanzania		Uganda		Zambia	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI	Adj. OR 95% CI
Hunger	**2.24** **1.11-4.53**	1.55 0.78-3.07	0.77 0.36-1.66	0.77 0.38-1.54	1.95 0.77-4.92	1.38 0.34-5.59	0.65 0.24-1.78	1.21 0.68-2.16	0.72 0.21-2.50	0.48 0.20-1.16
Current Alcohol Use	1.75 0.83-3.68	1.05 0.65-1.69	1.09 0.61-1.94	1.48 0.80-2.75	2.10 0.68-6.51	**4.85** **1.90-12.4**	0.78 0.39-1.57	0.84 0.51-1.38	0.58 0.13-2.53	**8.92** **1.81-44.0**
Problem Drinking	**2.36** **1.02-5.46**	1.34 0.70-2.55	1.47 0.70-3.08	0.63 0.36-1.10	1.57 0.82-2.98	0.63 0.24-1.66	1.21 0.54-2.68	**1.75** **1.13-2.71**	2.73 0.65-11.5	1.67 0.59-4.70
Bullied	0.97 0.53-1.76	1.12 0.77-1.62	**1.78** **1.10-2.90**	1.88 0.98-3.58	1.11 0.62-2.02	1.44 0.76-2.73	1.23 0.64-2.37	1.16 0.74-1.81	0.92 0.34-2.50	1.12 0.27-4.60
Sadness	1.07 0.64-1.79	1.36 0.66-2.82	**1.91** **1.21-3.00**	**3.19** **2.02-5.05**	**2.85** **1.49-5.47**	**3.37** **1.61-7.04**	**2.59** **1.57-4.27**	**2.74** **1.42-5.29**	0.94 0.37-2.40	1.64 0.68-3.94
Lonely	1.36 0.62-2.98	1.76 0.98-3.17	**2.43** **1.20-4.93**	**2.12** **1.08-4.19**	1.01 0.29-3.49	**4.11** **1.56-10.8**	1.36 0.68-2.71	1.89 0.80-4.46	0.79 0.20-3.15	0.59 0.21-1.63
Worrying	1.33 0.71-2.52	1.66 0.94-2.93	1.66 0.79-3.45	1.79 0.82-3.92	**4.11** **1.19-14.2**	0.21 0.03-1.35	1.50 0.78-2.89	1.59 0.91-2.77	0.81 0.21-3.16	0.81 0.26-2.48
No Friends	1.65 0.85-3.18	1.05 0.42-2.61	0.97 0.46-2.05	0.87 0.58-1.29	0.65 0.13-3.11	1.11 0.44-2.77	0.80 0.33-1.98	1.68 0.80-3.50	1.87 0.48-7.28	0.42 0.14-1.26
Missed School	1.26 0.58-2.70	1.33 0.73-2.42	0.96 0.59-1.56	**1.94** **1.11-3.37**	0.98 0.56-1.71	1.17 0.52-2.65	1.22 0.76-1.95	1.07 0.67-1.70	0.64 0.19-2.19	0.78 0.24-2.58
Illicit Drug Use	0.68 0.18-2.52	1.43 0.38-5.34	0.93 0.36-2.40	1.51 0.41-5.48	4.14 0.53-32.2	0.45 0.05-4.16	1.76 0.66-4.70	0.94 0.35-2.53	**5.24** **1.03-26.8**	0.37 0.08-1.76
Physical Fights	0.86 0.49-1.50	1.11 0.72-1.71	1.52 0.91-2.53	1.66 0.84-3.28	0.99 0.54-1.83	1.21 0.57-2.58	1.17 0.73-1.88	1.24 0.74-2.09	1.83 0.53-6.29	1.25 0.49-3.22
Physical Attacks	1.54 0.97-2.44	1.32 0.82-2.14	--	--	0.69 0.30-1.55	1.19 0.49-2.93	--	--	--	--
Early Sexual Initiation	1.69 0.64-4.46	0.91 0.34-2.44	0.85 0.48-1.49	1.71 0.87-3.33	1.65 0.56-4.87	1.81 0.55-6.03	1.53 0.99-2.37	1.70 0.54-5.38	1.12 0.34-3.68	0.45 0.10-1.97

CHAPTER V

DISCUSSION

5.1 Discussion

This study used the GSHS student surveys to analyze and compare the prevalence and correlates of suicidal ideation among youth in Botswana, Kenya, Tanzania, Uganda and Zambia, all developing countries in sub-Saharan Africa. This study also examined differences in prevalence and correlates of suicidal ideation between boys and girls in each country in an attempt to identify how these risk behaviors vary by gender across country settings. Another goal of this research is to use the findings to provide information regarding the epidemiologic characteristics of suicidal behavior in sub-Saharan Africa, raise awareness of the problem of suicidal behavior and to inform the development of successful interventions, and to promote research, resources and prevention efforts in the mental health area in these under-resourced and developing countries.

The analyses herein showed variability in the prevalence of suicidal ideation across these African countries. Zambia had the highest prevalence of suicidal ideation (31.9%) among all students, followed by Kenya (27.9%), Botswana (23.1%), Uganda (19.6%) and Tanzania (11.2%).

The prevalence of suicidal ideation in Botswana, Kenya, Uganda and Zambia was higher (19.6%-31.9%) than in the U.S. (16.9%) and Europe as seen in prior studies (Omigbudon et al,. 2008; Swahn et al., 2010). Such high prevalence is in support of

prior studies (Muula et al., 2007; Omigbodun et al., 2008; Rudatsikira et al., 2007; Swahn et al., 2010).

Comparisons of the risk factors across countries show that Zambia had the highest prevalence across all 13 risk factors. Tanzania had the lowest prevalence for hunger, current alcohol use, problem drinking, bullying victimization, sadness, feeling lonely, worrying, having no friends, and drug use. Missed school and early sexual initiation had the lowest prevalence in Botswana, while physical fighting was lowest in Uganda. Prevalence for physical attacks was very high in Botswana (55.9%) and Tanzania (56.6%) where that variable was available. It is unknown why the prevalence of the risk factors are so high in Zambia. Further research should be conducted in Zambia to address these risk factors and the underlying reasons for their magnitude. In addition to a high HIV/AIDs prevalence, Zambia suffers from greater poverty and less education than the other countries examined in this study (see Table 1.1) and such characteristics may impact the risk factors for suicidal ideation.

Correlates of suicidal ideation among all students across countries

The results showed unique, varied and shared risk factors across the five countries. The most common risk factor for suicidal ideation across the countries was sadness, followed by feeling lonely. Sadness was consistently associated with suicidal ideation in Kenya, Tanzania and Uganda, but not in Botswana and Zambia. Sadness also showed a strong association with suicidal ideation in the three countries: Kenya (Adj. OR=2.45, 95% CI: 1.76-3.42), Tanzania (Adj. OR=3.06, 95% CI:1.75-5.37 and Uganda (Adj. OR=2.65, 95% CI:1.85-3.79). The prevalence of sadness across all countries,

except for Tanzania, was at a much higher prevalence (41.9%-53.3%) than the 28.5% found in the U.S. in previous research (Swahn et al., 2010). The fact that sadness is significant across a majority of the five countries raises serious issues about the mental health of these students and its contribution to suicidal ideation. Cultural variations in how sadness is defined and thought of among students are also important to consider. Further research must be conducted to discover and address the underlying causes before implementing prevention strategies.

Feeling lonely was significantly associated with the outcome variable in Kenya (Adj. OR=2.23, 95% CI:1.27-3.92) and Tanzania (Adj. OR=2.40, 95% CI:1.10-5.20). Loneliness has not been a major focus of attention in studies of adolescent suicide, but has been found to be associated to suicide ideation and attempts (Page & West, 2011). This area certainly deserves more attention given the problem of orhpanhood, isolation lack of support and disconnection in sub-Saharan Africa.

Other significant risk factors for suicidal ideation identified in this study were hunger, problem drinking and worrying in Botswana, current alcohol use in Tanzania, and, bullying victimization and physical fighting in Kenya. Bullying is a prevalent problem globally and a well-documented risk factor for suicidal ideation and attempts (Kim & Leventhal, 2008; Swahn & Bossarte, 2007). However, in this study it was only significant among students in Kenya.

Alcohol use is also a prevalent problem across the world (WHO, 2011b) and has been identified as a strong correlate of suicidal behavior across countries and cultures (Muula et al., 2007; Rudatsikira et al., 2007; Swahn et al., 2010). Given such previous findings, alcohol use was surprisingly only significantly associated with suicidal ideation

in Tanzania. Problem drinking was only found to be a significant predictor of suicidal ideation among Botswana students. Physical fighting was significantly associated with suicidal ideation only among students in Kenya. Drug use was not associated with suicidal ideation among students in any of the countries.

Correlates of suicidal ideation by gender across countries

Gender was only found to be significantly associated with suicidal ideation in Uganda, but the study did find some gender differences in significant predictors for suicidal behavior. Sadness remained significantly associated across all boys and girls in Kenya, Tanzania and Uganda; however, it still showed no association in Botswana and Zambia. Feeling lonely was a significant predictor for suicidal ideation in Kenya and Tanzania among students, but once stratified by gender, it retained its association among Kenya boys and girls and only Tanzanian girls. The background of conflict, loss, family fragmentation, and poverty presents enhanced risk for suicidal behavior among youths; Africa has had the added burden of critical psychosocial stress associated with HIV/AIDS, including stigma, discrimination, isolation, lack of support from family and friends, loss of parents or family members (Schlebusch et al., 2009). High levels of sadness, hopelessness, and anxiety increase psychosocial distress and can lead to suicidal behavior in the form of suicidal thoughts, attempts and actual suicide (Page & West, 2011). In a recent cross-national pooled sample of African youth using data from the GSHS surveys, the researchers looked at indicators of psychosocial distress (sadness/hopelessness, loneliness, lack of friends and worrying. and their association with suicidal ideation) (Page & West, 2011). This recent study found that having feels of

sadness or hopelessness almost every day for two weeks or more in a row that stops one from doing usual activities was the overall strongest predictor of suicidal ideation. It was also found that feeling lonely, worrying, having no close friends were also associated with suicidal ideation. The analyses herein found all risk factors to be predictors of suicidal ideation in certain countries and gender groups, except for having no close friends.

Bullying victimization was only found to be significantly associated with suicidal ideation among boys in Kenya once stratified by gender. Alcohol use was significant only among girls in Tanzania and Uganda once analyses were stratified by gender. Problem drinking was only found to be a significant predictor of suicidal ideation among Botswana students overall; however, once stratified by gender, problem drinking resulted in a significant association among Botswana boys and Uganda girls only.

The risk factors, drug use and physical fights, yielded interesting results. Drug use was not associated with suicidal ideation across any of the countries, but showed a strong association among Zambian boys once the analyses were stratified by gender. Epstein and Spirito (2010) found drug use (sniffing glue, injecting drugs) showed associations with all types of suicidality across gender. Illicit drug use has been found to increase suicidal ideation and attempts as shown in a previous study of Nigerian youth (Omigbodun et al., 2008). The converse was true of physical fighting. While physical fighting was significantly associated with suicidal ideation among students in Kenya, such risk factor showed no association among any of the boys or girls of any of the countries. Previous research regarding gender differences showed that carrying a weapon and fighting (in school for boys and outside of school for girls) were consistently related

to suicidal ideation and attempts. (Epstein & Spirito, 2010). In this study, having no friends, physical attacks and early sexual initiation still showed no significant association with suicidal ideation in any of the countries once stratified by gender. Prior research has found that early sexual initiation was related to making a plan to attempt suicide and actually attempting suicide across gender (Epstein & Spirito, 2010).

In a study of Nigerian youth, Omigbodun et al. (2008) found no gender difference in the rates of suicidal ideation and attempt, but there were some gender differences in significant predictors for suicidal behavior. The findings of this study are consistent with those results. Overall, gender differences were found with hunger, alcohol use, problem drinking, bullying victimization, sadness, loneliness, worrying, missed school and drug use.

Summary

The analyses of the prevalence and correlates of suicidal ideation yielded comparisons and contrasts among the five sub-Saharan countries and among boys and girls therein. Due to the relatively few studies conducted in Africa among adolescents, there is little known about the prevalence, patterns and predictors of suicidal behavior across these countries. There are many possible factors related to the culture and lifestyle which could account for these variations, one of which could be greater exposure to certain risk factors because of the previously discussed adverse sub-Saharan Africa issues and challenges.

5.2 Limitations

There are several limitations that need to be considered when interpreting the findings. First, the GSHS was administered to students only, and therefore does not capture the occurrence of suicidal ideation and risk behaviors among those who do not attend school. Second, the GSHS is a self reported survey and, therefore may have biases since some students may not answer truthfully, may not recall, or maybe not be comfortable to disclose sensitive information, and others may simply misunderstand the question or mark an answer incorrectly. Third, missing data is also a limitation with this study since not all participants answered every question. The use of the missing-indicator method to include participants with partially missing data in the analyses may have biased some of the regression coefficients and impacted the findings. Fourth, although the same questions were included in the GSHS surveys for the five sub-Saharan African countries, there may be cultural differences affecting the meaning of suicide, suicidal behavior and the various risk factors examined herein. Fifth, the analyses did not account for the different years of survey administration, or any other differences between the countries, including any differences across school systems and participant recruitment (Swahn et al,. 2010). Sixth, the analyses did not include other potential risk factors that may contribute to suicidal ideation. Finally, it was not possible to examine HIV/AIDS as an important risk factor for suicidal behavior since the GSHS question on this issue is combined with sexually transmitted disease status, in addition to not being available in the publicly available datasets.

5.3 Recommendations and Implications

As this study has shown, there are certain risk factors associated with suicidal behavior among students and boys and girls in sub-Saharan Africa who participated in the GSHS survey. Identifying modifiable risk factors plays a crucial role in the development and implementation of interventions which may prevent such behavior (Krug et al., 2002).

There is a need to recognize suicidal ideation as an important issue among adolescents in sub-Saharan African countries. The design, implementation and evaluation of public health interventions aimed at reducing suicide in these countries should incorporate an understanding of the risk factors and gender issues associated with suicidal ideation and behavior shown by this study and those discussed in the literature review.

It is especially challenging to obtain funding for suicide prevention in developing countries like those in sub-Saharan Africa, where most of their funds appear to go towards treatment and prevention of major disease such as malaria, HIV/AIDS and tuberculosis (Lett et al., 2006). Therefore, it is extremely important for a sustainable surveillance system to be in place to collect reliable data which can be analyzed and used to inform all partners and stakeholders that there is a genuine need for suicide prevention and mental health programs. For sub-Saharan countries, it would be beneficial to conduct the GSHS survey on an annual basis so that further analyses can be computed, and trends and tendencies of suicidal behavior among students can be accurately documented.

Some steps have been made to address and develop mental health programs in sub-Saharan Africa. Mental health promotion in low-income countries should be treated as necessity as mental health affects other aspects of health and productivity. Ovuga, Boardman and Wassermann (2007) have described how mental health care leaders in Uganda are currently promoting the provision of mental health care at the primary care local district level, after decades of neglect in this area. These initiatives from Uganda started as a local community response to high levels of alcohol abuse and suicide behavior. This initiative serves as a cost-effective model to engender the necessary attention and engage community support towards mental health research and interventions in sub-Saharan Africa. It has also shown that local communities can be empowered to supported their own mental health services and that primary health care providers at the local level can be trained to treat adults and adolescents with mental health issues.

A global policy initiative in mental health is currently being promoted by WHO, which is appealing to countries to increase their support for mental health services. For the past two years the Department of Mental Health and Substance Abuse of the WHO has supported the development of a coordinated child and adolescent mental health programme. The program has fostered a recognition that child and adolescent mental health is a necessary priority for the healthy development of societies.

The World Health Organization's Department of Mental Health and Substance Abuse has initiated three programs which together form a coordinated effort to address global child and adolescent mental health problems. The three program components include: 1) a campaign on the stigma associated with mental illness among youth, 2) a

global policy initiative that will equip ministries of health to develop coordinated, responsive programs where child and adolescent mental health will be integrated into overall health care, and 3) a program to assess the global treatment gap associated with mental illness.

Child and adolescent mental health is central to the future development of low income countries throughout the world, but in particular in sub-Saharan Africa where AIDS orphans, AIDS affected and infected youth and youth marginalized because of lack of economic opportunity and political and socio-economic instability are jeopardizing the future of whole nations.

Implications for research and practice

The findings of this study have shown that suicidal ideation is very prevalent across four of the five sub-Saharan African countries and that girls experience more suicidal ideation than boys across all countries, except for Tanzania. However, the correlates of suicidal ideation were both similar and different across the five countries and among boys and girls in these countries. With respect to similarities, sadness was associated with suicidal ideation across three of the five countries. The risk factors for suicidal ideation varied as predictors for boys and girls across the countries. Sadness remained significantly associated across all boys and girls in Kenya, Tanzania and Uganda. Feeling lonely retained its significant association among both Kenya boys and girls, but remained significant predictor only for Tanzanian girls.

Since there is a dire need for more research on adolescent suicidal behavior in a region where so much focuses on infectious diseases, an updated GSHS survey for the

African countries would assist in contributing to greater understanding of the trends in this area. Additional research to adequately capture sadness, depression and hopelessness across different cultural contexts and gender and in the face of so many pressing issues in Africa should be a priority. An updated nationally representative survey of students and youth in sub-Saharan African countries should be undertaken to include more measures of sadness, depression, hopelessness, orphanhood and HIV/AIDs. A longitudinal study of suicidal behavior risk factors among youth and should also be a priority.

In addition, developing child mental health strategies and school-based mental health programs in low-income countries, as initiated by WHO, may reduce suicidal behavior. Child and adolescent mental health needs to be integrated into the primary health care systems, to reduce the treatment gap and stigma in this area.

5.4 Conclusion

Despite the limitations of the current study, the results identified the prevalence and correlates of suicidal ideation among students in five countries in sub Saharan Africa and the similarities and differences associated with them. The associations between the risk factors examined and the outcomes have helped to increase the understanding of a neglected, but increasing problem in Sub-Saharan Africa. As discussed earlier in this document, suicidal behavior has a large number of underlying causes. The factors that place individuals at risk for suicide are complex and interact with one another. Identifying these factors and understanding their roles in both fatal and non-fatal suicidal

behavior are central to preventing suicides. It is important to use this research to bring attention to the need for suicide prevention programs, surveillance systems, and additional research on this topic in sub-Saharan African countries. The populations in these countries are certainly burdened with HIV/AIDS, malaria, other infectious diseases, and other pressing political and socio-economic issues, but resources should also be allocated to mental health treatment of disease and suicide prevention. With a large percentage of the population in many sub-Saharan countries being under the age of 18, the prevalence of suicidal ideation and the rate of deaths attributed to suicide will continue to be a serious public health concern unless proper programs aimed at suicide prevention are implemented.

REFERENCES

Adinkrah, M. (2011) Epidemiologic Characteristics of Suicidal Behavior in Contemporary Ghana. *Crisis*, 32(1), 31-36.

Bertolote, J. & Fleischmann, A. (2009). A global perspective on the magnitude of suicide mortality. In D. Wasserman and C. Wasserman (Eds.) *Suicidology and suicide prevention: A global perspective* (pp.) Oxford England: Oxford University Press.

Bertolote J. & Wasserman, D. (2009). Development of definitions of suicidal behaviours. In D. Wasserman and C. Wasserman (Eds.) *Suicidology and suicide prevention: A global perspective* (pp. 87-90) Oxford England: Oxford University Press.

Canetto, S. (2008). Women and suicidal behavior: A cultural analysis. *American Journal of Orthopsychiatry*, *78*(2), 259-266.

Centers for Disease Control and Prevention. (2008). Suicide facts at a glance. Retrieved from http://www.cdc.gov/ViolencePrevention/pdf/Suicide-DataSheet- a.pdf

Centers for Disease Control and Prevention. (2009) Injury prevention and control. Retrieved from http://www.cdc.gov/violenceprevention/pub/youth_suicide.html

Centers for Disease Control and Prevention. (2010). Retrieved from www.cdc.gov/violenceprevention/suicide/definitions.html),

Central Intelligence Agency. (2011). The World Factbook. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/index.html

Cheng A.T.A., Gau S.F., Chen T.H.H., Chang J.C. & Chang Y.T. (2004). A 4-year longitudinal study on risk factors for alcoholism. *Arch Gen Psychiatry* 61.

Eaton, D.K., Kann, L., Kinchen, S., Shanklin, S., Ross, J., Hawkins, J., et al. (2008). Youth risk behavior surveillance—United States, 2007. MMWR, 57(SS04), 1-131.

Epstein, J.A. & Spirito, A. (2010). Gender-specific risk factors for suicidality among high school students. *Archives of Suicide Research*, 14(3), 193-205

Foster, G. (2006). Children who live in communities affected by AIDS. The Lancet, 367, 700-701.

Global School-based Student Health Survey. Atlanta (GA): Centers for Disease Control and Prevention. Retrieved from http://www.cdc.gov/GSHS/.

Grunbaum, J. A., Kann, L., Kinchen, S., Ross, J., Hawkins, J., Lowry, R., et al. (2004). Youth risk behavior surveillance—United States, 2003. *MMWR*, 53(SS02), 1-96.

Hjelemland, H., Knizek, B.L., Kinyanda, E., Musisi, S., Nordvik, H., & Svarva, K. (2008). Suicidal behavior as communication in a cultural context: A comparative study between Uganda and Norway. *Crisis*, 29(3), 137-44.

Juan, W., Xiao-Juan, D., Jia-Ji, W., Xin-Wang, W. & Liang, Xu (2010). The associations between health risk behaviors and suicidal ideations and attempts in an urban Chinese sample of adolescents. *Journal of Affective Disorders*, 126, 180-187.

Kim, Y.S., & Leventhal B. 2008. Bullying and suicide: A review. *Int J Adolesc Med Health.* 20(2):133-54.

King, R.A., Schwab-Stone, M., Slisher, A.J. et al., 2001. Psychosocial and risk behavior correlates of youth suicide attempts and suicidal ideation. *J.Am.Acad.Child Adolesc. Psychiatry* 40(7), 837-846.

Kinyanda, E., Kizza R., Levin, J., Ndyanabangi, S., & Abbo, C. (2011) Adolescent Suicidality as seen in rural northeastern Uganda: prevalence and risk factors. *Crisis* 32(1), 43-51.

Kinyanda, E., Hjelmeland, H., Musisi, S., Kigozi, F. & Walugembe, J. (2005). Repetition of deliberate self-harm as seen in Uganda. *Archives of Suicide Research*, 9, 333-344

Krug, E.G., Dahlberg, L.L., Mercy, J.A., Zwi, A.B., & Lozano, R. (2002). *World report on violence and health*. Geneva: World Health Organization.
Available at URL: http://whqlibdoc.who.int/publications/2002/9241545615_eng.pdf.

Lett, R.R., Kobusingye, O.C., & Ekwaru, P. (2006). Burden of injury during complex political emergency in Northern Uganda. *Canadian Journal of Surgery*, 49(1), 51- 57.

Miettinen OS (1985). Theoretical epidemiology. John Wiley & Sons Inc., New York.

Muula, A.S., Kazembe, L.N., Rudatsikira, E., & Siziya, S. (2007). Suicidal ideation and associated factors among in-school adolescents in Zambia. *Tanzania Health Res Bull*, 9(3):202-06.

Nock, M.K., Borges, G., Bromet, E.J., Alonso, J., Angemeyer, M., Beautrais, A., et al. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry*, 192, 98-105.

Omigbodun, O. (2008). Developing child mental health services in resource-poor countries. *Int Rev Psychiatry*, 20(3), 225-35.

Omigbodun, O., Dogra, N., Esan, O., & Adedokun, B. (2008). Prevalence and correlates of suicidal behaviour among adolescents in Southwest Nigeria. *Int J Soc Psychiatry*, 54(1), 34-46.

Ovuga, E., Boardman, J., & Wassermann, D. (2005). Prevalence of suicide ideation in two districts of Uganda. *Arch Suicide Res*, 9(4), 321-32.

Ovuga, E., Boardman, J., & Wassermann, D. (2007). Integrating mental health into primary health care: local initiatives from Uganda. *World Psychiatry*, 6:60-1.

Page R.M. & West, J.H. (2011) Suicide ideation and psychosocial distress in sub-Saharan African youth. *Am J Health Behav*, 3592), 129-141.

Reza, A., Mercy, J.A., & Krug, E. (2001). Epidemiology of violent deaths in the world. *Injury Prevention*, 7(2), 104-11.

Rudatsikira, E., Muula, A.S. Siziya, S.,& Twa-Twa, J. (2007a). Suicidal ideation and associated factors among school-going adolescents in rural Uganda. *BMC Psychiatry*, 7,67.

Rudatsikira, E., Siziya, S., Muula, A.S. (2007b). Suicidal ideation and associated factors among school-going adolescents in Harare, Zimbabwe. *Journal of Psychiatry in Africa*, 17(1), 93-98.

Schlebusch, L., Burrows S. & Vawda, N. (2009) Suicide prevention and religious traditions on the African continent. In D. Wasserman and C. Wasserman (Eds.) *Suicidology and suicide prevention: A global perspective* (pp. 63-69) Oxford England: Oxford University Press.

Swahn, M.H., & Bossarte, R.M. (2007). Gender, early alcohol use, and suicide ideation and attempts: Findings from the 2005 Youth Risk Behavior Survey. *Journal of Adolescent Health*, 41(2), 175–181.

Swahn, M.H., Bossarte, R.M., Eliman, D.M., Gaylor E. & Jayaraman, S. (2010) Prevalence and correlates of suicidal ideation and physical fighting: a comparison of students in Botswana, Kenya, Uganda, Zambia and the Unites States. *Int Public Health Journal* 2(2).

U.S. Public Health Service. (1999). *The Surgeon General's call to action to prevent suicide.* Washington, DC: Author. Retrieved from http://www.surgeongeneral.gov/library/calltoaction/calltoaction.pdf.

World Health Organization. (2008). World Health Statistics, 2008. Retrieved from http://www.who.int/whosis/whostat/2008/en/index.html.

World Health Organization. (2009). Suicide. Last updated 2009. Retrieved from http://www.who.int/topics/suicide/en/.

World Health Organization (2011a). Suicide prevention (SUPRE). Retrieved from http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/).

World Health Organization (2011b). Global Status Report on Alcohol and Health 2011. Retrieved from http://www.who.int/substance_abuse/publications/global_alcohol_report/en/.