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Suicide Ideation and Its Associated Risk Factors among Adolescent Students in the Eastern Mediterranean Region

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Suicide Ideation and Its Associated Risk Factors among Adolescent Students in the Eastern Mediterranean Region

By

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B.S., Biology, Chemistry

GEORGIA STATE UNIVERSITY

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

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA

30303

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Suicide Ideation and Its Associated Risk Factors among Adolescent Students in the Eastern
Mediterranean Region

By

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ABSTRACT

Purpose: The intention of this study is to examine and compare the prevalence and correlates of suicide ideation among the youth in four Eastern Mediterranean Region (EMR) countries, namely Morocco, Jordan, United Arab Emirates and Lebanon. The results from this study are a valuable resource for further understanding suicidal behavior among youth in a region where the subject is often understudied and considered taboo. Additionally, findings from the study are important in prevention efforts in order to reduce suicide related behaviors and injuries among youth in EMR countries. The study also examined the correlates and variables associated with suicide ideation as differentiated by gender in an effort to see how these behaviors varied between boys and girls.

Methods: The results of the study were derived using secondary analyses of datasets from the Global School-based Student Health Survey (GSHS) which is conducted by the World Health Organization. The study analyzed data on students who fell primarily between the ages of 12 to 16 from the countries of Jordan (N=2197, 2007), Lebanon (N=5115, 2005), Morocco (N=2670, 2006) and United Arab Emirates (N=15790, 2005). The data was analyzed using logistical regression analyses to determine the associations between suicidal ideation and eight risk factors, which included being a victim of bullying, having a lack of close friends, feeling sad or hopeless, consuming alcohol, using illicit drugs, missing school, being involved in a physical fight, and dealing with hunger. The results of the study were also evaluated to examine differences among genders and the risk factors as associated with suicide ideation as well as differences between age groups.

Results: The results of this study suggest that suicidal ideation among youth in EMR countries may be influenced by social, political, cultural and economic factors. Females showed higher rates of suicide ideation. Several of the eight risk factors analyzed showed significant associations to suicide ideation.

Conclusion: There is a need for increased research into the areas of mental health in the EMR, especially in the area of suicide and suicide related behaviors. Suicide related statistics may be underreported in many nations of the EMR which are predominantly Islamic, where suicide is strongly prohibited by religion. Previous studies indicate that suicide ideation is strongly associated with certain risk factors. This study analyzed eight of these risk factors using a secondary logistical regression analysis of data from the Global Student Health Survey which is conducted annually by the WHO. The risk factors included in the study are bullying victimization, alcohol use, illicit drug use, having no friends, feeling sad, missing school, physical fighting and hunger. Additionally, associations were examined among different age groups ranging from 12 to 17 years and among the two genders. Several of the risk factors were shown to have a strong association to suicide ideation. Suicide ideation was more common among girls than in boys among all the countries studied. The results of this study may be useful to those looking to design and implement educational suicide prevention programs among school-age children in the EMR.

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CHAPTER 1

INTRODUCTION

1A. Background: Global Burden of Suicide

Suicide remains a significant public health problem, causing almost half of all violent deaths and resulting in roughly one million fatalities every year, as well as an economic cost of billions of dollars (World Health Organization [WHO], 2004). Worldwide, more people die from suicide than from all homicides and wars combined (International Association for Suicide Prevention [IASP], 2005). Although suicides represent 1.4% of the Global Burden of Disease, the losses extend much further. Current statistics from the Suicide Prevention (SUPRE) branch of the WHO show that suicide has a global mortality rate of 16 per 100,000; this calculates to 1 death every 40 seconds caused by suicide (WHO, 2011). Trends show the problem is also on the rise, with estimates suggesting fatalities could rise to 1.5 million deaths by 2020 (WHO, 2004). In the last 45 years, suicide rates have increased by 60% worldwide, and suicide is among the three leading causes of death among those aged 15-44 years in some countries, and the second leading cause of death in the 10-24 years age group; these statistics do not include suicide attempts which are up to 20 times more frequent than completed suicide (WHO, 2011). Traditionally, suicide rates have been the highest among elderly males, but rates among young people have been increasing at an alarming rate. Suicide rates among youth have increased to such an extent that young people are now the group at the highest risk of suicide in a third of all countries, in both developed and developing countries (WHO, 2011).

Globally, rates vary from region to region, which indicates that social, economic, cultural, political and geographical factors play a major role in suicide ideation and behaviors (Wasserman, 2005). Among countries reporting suicide, the highest rates are found in Eastern

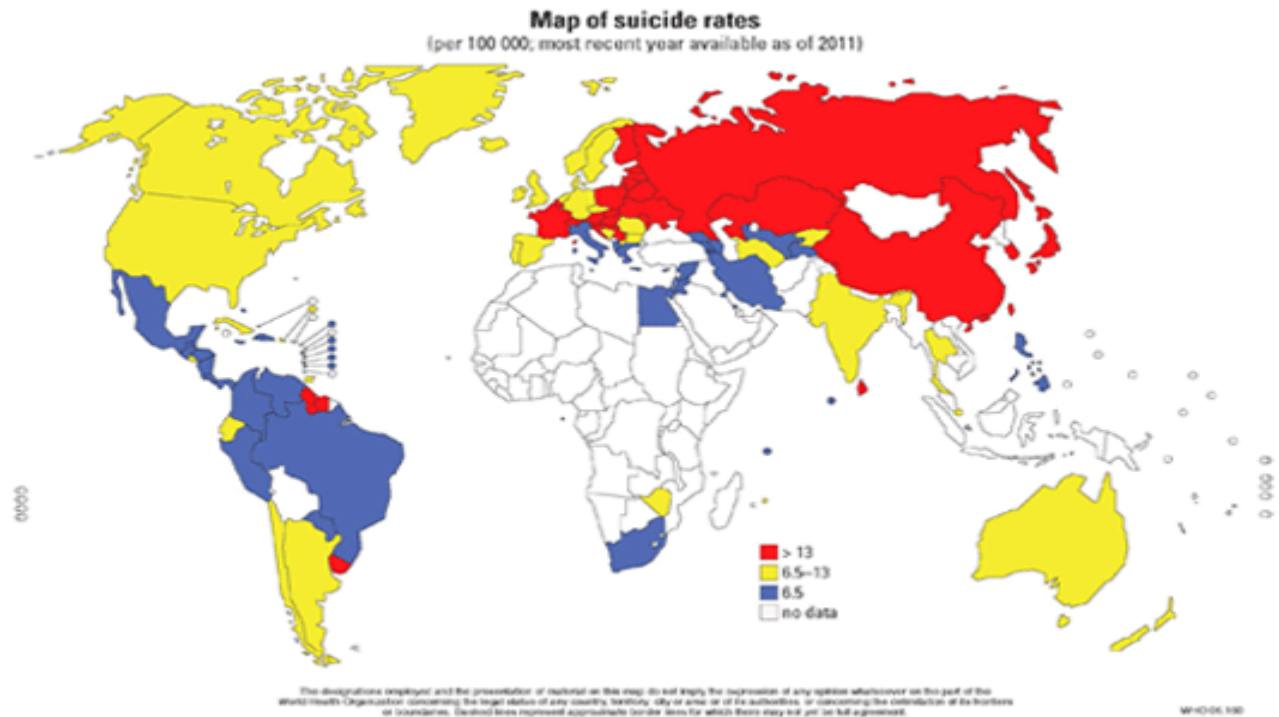
Europe and the lowest rates are found mostly in Latin America, in Eastern Mediterranean countries and a few Asian countries (WHO, 2011). Subsequently, there is very little information available on suicide in African countries (Palmier, 2011). In the Western Pacific Region, suicide accounts for 2.5% of all economic losses due to the disease (WHO, 2011). In most European countries, the number of suicides is larger than annual traffic fatalities (Brock, 2007). In general, more men than women commit suicide, with the exception of rural China. In most places, however, more women than men attempt suicide (WHO, 2004).

In the United States, current data from the Centers for Disease Control and Prevention (CDC) indicates that 36,909 suicide deaths were reported in the U.S. in 2011, with the highest rates among whites followed by Native Americans. Nationally, this places suicide as the tenth leading cause of death in the country, the highest rate of suicide in fifteen years (CDC, 2011). To put this in perspective, someone in the United States dies from suicide every 14.2 minutes (CDC, 2011). These statistics do not include suicide attempts which also contribute to economic burden through cost of medical care, loss of income, and other factors; nearly 1,000,000 people make a suicide attempt in the U.S. every year (CDC, 2011). In the United States, men are nearly four times more likely to die by suicide than women, although women attempt suicide three times as often as men, statistics that mirror the global trend in differences among suicide attempts and completion among the genders (Voros, 2004). Additionally, suicide rates in the U.S. are highest among individuals aged 40 to 59, although recent trends indicate that suicide among those under the age of 22 are at their highest in 15 years (CDC, 2011).

Suicide results from a complex interaction of biological, genetic, psychological, sociological, cultural and environmental factors. The CDC classifies suicide under self-directed violence; it is defined as death caused by self-directed injurious behavior with any intent to die as

a result of the behavior. A suicide attempt is defined as a non-fatal self-directed potentially injurious behavior with any intent to die as a result of the behavior; it may or may not result in injury (Kandel et al, 1991). The definition of suicide ideation is thinking about, considering or planning for suicide (King et al, 2001). While these definitions fall into subsequent degrees of inflicted self-harm, they often follow one another in an individual who is predisposed to suicidal behavior; thus, a person who displays suicide ideation should be counseled immediately to prevent these thoughts into developing into actions that inflict self-injury. Suicidal behaviors are more common under certain circumstances which may be labeled as risk factors for suicide (*Psychological Autopsy*, 1985). These risk factors include, but are not limited to low socioeconomic status and educational levels, loss of employment; social stress, problems with family functioning, social relationships and support systems; trauma, such as physical and sexual abuse; personal losses; mental disorders; feelings of hopelessness or worthlessness; sexual orientation issues; impaired judgment, lack of impulse control and self-destructive behaviors; poor coping skills; physical illness or chronic pain; exposure to suicide of other people; access to means to complete self-harm; and destructive and violent events such as war or natural disasters (Preventing Suicide, a Resource for Counselors [WHO] 2006). Certain special populations display especially high rates of suicide mortality, such as combat-exposed war veterans and active duty soldiers (Bryan et. al., 2012), cancer patients (Crocetti et. al., 2012), and incarcerated individuals (Fruhwald et. al. 2002). The following map from the WHO website shows suicide rates from around the world.

Figure 1.1 Map Showing Global Suicide Rates (WHO, 2011)



http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/

1B. Purpose of the Study

In general, suicide and adolescent mental health are topics that are understudied in the Eastern Mediterranean Region. The aim of this study is to examine the correlates that may be associated with suicide ideation, and scrutinize their relationship to suicide among school-age children in the EMR. By treating certain issues that may be considered risk factors for suicide ideation as variables and running logistical regression analysis, the study will be able to compare which variables contribute more significantly to suicidal behaviors. Another purpose of the study is to see how gender differences vary across the spectrum of variables and correlates to show how suicidal ideation and behaviors vary by gender.

Certain information is already known about factors that contribute to suicidal behavior, and which groups are more likely to be at risk. As previously mentioned, various studies have shown that suicidal ideation and attempts are up to four times higher in females than in males, although males tend to carry suicide to completion more often than females (Krug et al., 2002, Park et al., 2005). The major reason for the higher rates of suicide completion among males in spite of fewer attempts compared with females is thought to be because males often attempt more violent means of committing suicide compared to females; males are more likely to use firearms, asphyxiation or hanging as opposed to females, who are more likely to choose self-poisoning (Kaplan et al., 2009).

Additionally, demographic-behavioral variables, such as socioeconomic status, behavioral variables such as smoking and drinking, and psychosocial variables such as a lack of friends, life satisfaction, family relationships and depression are all crucial factors that contribute to suicide ideation (Ilgen et al, 2011); the intent of this study is to examine these variables and determine the extent of their relationship to suicide ideation.

The area included in the study, the EMR, is one of the most diverse regions in the world. The four countries being examined, namely Jordan, Lebanon, Morocco and the UAE, differ in several aspects including liberality, economic status, political climate, religious environment, and educational and health care systems. The study uses data on students collected by the WHO in the GSHS in each of these countries; thus, the study will aim to compare the prevalence and correlates of suicidal behavior among school-age children through secondary analysis of the data. Such studies are especially needed in the EMR, where suicide is both understudied and underreported, and mental health of adolescents is a topic that is largely ignored.

1C. Research Questions and Proposed Hypotheses

The study intends to answer the following questions:

- A. What are the correlates of suicide ideation among school-age children in each of the EMR nations of Jordan, Lebanon, Morocco and the UAE? How strong are the correlations between the variables being studied and the outcome of suicide ideation and/or suicide behaviors?
- B. What are the correlates of suicide ideation among school-age children across all four EMR countries as a single group? What is the strength of their relationship?
- C. How do the correlations vary by gender among the four individual countries?
- D. How do the correlations vary by gender across all four countries as a whole?

1D. Suicide in the Eastern Mediterranean Region (EMR)

The WHO states that suicide rates are the lowest among all regions of the world in the Eastern Mediterranean Region and the Central Asia republics. Suicide is the 25th leading cause of death in the EMR, which is much lower than other regions of the world. One statistic that differs from other parts of the world, however, is that suicide rates for the EMR are much higher for females than for males in age groups 5-14 and 15-29 years. The peak age for suicide among females is 15-29 (8.6 per 100,000) years and 60+ (10.8 per 100,000) years for males. As a proportion of all deaths due to injury, suicides were significantly higher in females than in males. Females in high-income countries of the EMR had the lowest rates of suicide in all age groups; similarly, males in high-income countries of the EMR had a lower rate of suicide than males in low- and middle-income countries (Rezaeian, 2000).

Although rates of teen suicide are substantially lower in the EMR region than in any other region in the world, these statistics may be minimal due to underreporting. Mustafa Afifi

explains the reasons behind the underreporting of teen and adolescent suicides in the EMR in a bulletin published by the WHO in 2006. He states that first of all, there is a lack of research findings on adolescent and teen mental health; oftentimes, those studies that are available did not collect information using a uniform methodology, which prevents an accurate and sound comparison of the results collected. In an effort to address this problem, the WHO has created the Multisite Intervention Study on Suicidal Behaviours (SUPRE-MISS) (Afifi, 2006). He further states that there is a lack of an integrated management approach to adolescent health problems. Studies have shown that attempted suicides are associated with other risk behaviors in adolescents (Woods et. al., 1997). Data from the EMR shows that low self-esteem among adolescents is a strong predictor of health-compromising behaviors (Jaffer et. al., 2006). On the other hand, the protective effect of positive health practices on adolescent depression has also been reported (Afifi et. al., 2006). Thus, Afifi states that in suicide prevention among adolescents, promoting positive health practices and preventing risk behaviors are as important as the management of mental disorders. Furthermore, Afifi explains that since depression is a strong predictor of suicide, it needs to be studied more extensively in the EMR. Research has proven that the clinical significance and long-term implications of depressive symptoms in adolescents often do not depend on crossing the major depression diagnostic threshold (Lewinsohn et. al., 2000). Thus, Afifi explains that adolescents' depression may be best conceptualized as a continuum, with the study of sub-threshold syndromes being important predictors. Lastly, Afifi states that not all suicide is associated with depressive symptoms. The EMR is a region of the world that is a hot-bed of political and social upheaval and turmoil, and in such circumstances, the wish to not be present for a time may lead to a loss of impulse-control among adolescents.

1E. Description of the Eastern Mediterranean Region and information about countries in the study

Table 1.1 Country Facts

	Jordan	Lebanon	Morocco	UAE
Population	6,508,271	4,140,289	32,309,239	5,314,317
GDP	\$36.89 billion	\$62.23 billion	\$99.24 billion	\$360.1 billion
Per Capita	\$5,899	\$15,700	\$5,100	\$48,000
Median Age	22.4 years	30.4 years	27.3 years	30.2 years
Percent of Pop. Under 15 yrs.	34.9%	22.5%	27.4%	20.5%
Population Growth Rate	-0.965%	-0.38%	1.054%	3.055%
Percentage of Muslim Population	90%	59.7%	99%	96%
Percent Below Poverty Line	13.3%	28%	15%	19.5%
School Life Expectancy	13 years	14 years	10 years	13 years
Unemployment youth ages 15-24 years	27%	22.1%	21.9%	12.1%
Literacy Rate	93%	87.4%	56.1%	77.9%
Physicians Health Expenditures	2.45 per 1,000	3.54 per 1,000	0.62 per 1,000	1.93 per 1,000
Health Expenditures	4.5% of GDP	8.2% of GDP	5.5% of GDP	2.82% of GDP
Death Rate	2.74 deaths per 1,000 population	6.63 deaths per 1,000 population	4.76 deaths per 1,000 population	2.04 deaths per 1,000 population

(Facts taken from the CIA World Factbook 2012)

The four countries in this study were chosen to represent the countries of the EMR for various reasons. First of all, complete datasets were available by the WHO for the four countries chosen which allowed for a complete analysis to be conducted. The four countries also provide a more comprehensive representation of the EMR region because they vary in GDP, religious makeup, cultural aspects and political climate.

The WHO is the authority for public health within the United Nations system. According to the WHO, the Eastern Mediterranean Region comprises of 22 member states and the occupied

Palestinian territory (West Bank and Gaza Strip). The region has a population of almost 583 million people, and the official languages of the WHO in the EMR are Arabic, English and French. Other national languages that are also represented on a smaller scale include Farsi, Urdu, Dari, Pashto and Somali. For the purposes of this study, the countries of Jordan, Lebanon, Morocco and United Arab Emirates (UAE) were studied.

Jordan has a population of 5 million and borders Saudi Arabia to the east and south-east, Iraq to the north-east, Syria to the north and the West Bank and Israel to the West. Jordan shares control of the Dead Sea with Israel. The country is classified as that of “medium human development” by the 2011 Human Development report by the United Nations Human Development Programme. Jordan has a free market economy and emerging market; according to the CIA World Fact Book, the country has an “upper middle income” economy. Islam is the predominant religion in Jordan, with 92% of residents claiming to be Muslims. The country has an advanced healthcare system, but health services remain highly concentrated in the capital of Amman. Jordan’s health care system is divided between public and private institutions, and government figures have put total health spending at 7.5 percent of the gross domestic product. According to the CIA World Fact Book, life expectancy in Jordan is 80.18 years, which is the second highest in the EMR region, second to that of Israel. The literacy rate is 93 percent, and UNESCO ranked Jordan’s education system 18th worldwide for providing gender equality in education. The country’s education system ranks among the highest among countries in the developing world, and number one among Arab nations. Jordan is also considered one of the Arab world’s most cosmopolitan and westernized nations. Approximately 67 percent of Jordanian youth describe themselves as liberal, second only to Lebanese youth among the EMR states (ASDA’A Burson-Marsellar Arab Youth Survey, 2011).

Lebanon has a population of 4,224,000. It is bordered by Syria to the north and east and by Israel to the south. Lebanon's history since its independence in 1943 has been marked by periods of political stability and turmoil (*Bureau of Near Eastern Affairs*, U.S. Department of State, 2009). Syria occupied a large portion of the country until 2005. Since Lebanon's liberation in 2005, Hezbollah, a Shia Islamic militant group, has figured frequently in the country's conflicts with Israel; the country is 59.7 percent Muslim (CIA World Fact Book, 2011). Lebanon is a parliament democracy. The urban population in Lebanon is noted for its commercial enterprise, but the country is largely suited for agricultural activities. The Civil War which lasted from 1975 to 1990 heavily damaged Lebanon's economic infrastructure, but the government has taken steps to aid economic growth in recent years (Stinson, 2006). After the Lebanon War of 2006, the country experienced heavy losses in the economic sector; from 2007 to 2009, however, despite a global recession, Lebanon enjoyed a nine percent economic growth and hosted the largest number of tourists in its history (United Nations Report, 2012). By 2011, however, economic growth slowed to below average for the region. Life expectancy is 79.5 years on average as of 2011, with females averaging at 84 years and males at 77 years. Lebanon has a literacy rate of 90.0, and the country has private and public schools, colleges and universities. Compared to other EMR nations, Lebanon has a liberal media and literary scene.

Morocco is an EMR nation that is located in northern Africa and has a population of over 32 million. The country is bordered by Spain to the north, Algeria to the east and Western Sahara to the south. Morocco's economy is generally considered diverse but very fragile. The literacy rate is only 60 percent, and the country has high levels of abject poverty and extreme health care deprivation, and the life expectancy is 71.9 years (World Bank, 2011). The unemployment rates are high among all levels of education from the highly educated to the

unskilled; thus, there is a consistent atmosphere of social unrest in many cities and villages. In 2011, The United Nation's Human Development Index ranked Morocco 130th most developed country in the world, which is quite a poor ranking. The major resources of Morocco's economy are tourism and agriculture. The country is 99 percent Muslim (CIA World Fact Book, 2011).

In 2010, the United Arab Emirates was estimated to have a population of 8, 264,070 people. The country is located in the southeast of the Arabian Peninsula, and borders Oman to the east, Saudi Arabia to the south and shares a sea border with Qatar and Iran. Islam is the official religion of the UAE, but the country has a highly tolerant climate for other faiths due to its large influx of migrant workers from other nations. The country's oil reserves are considered seventh largest in the world, and its economy is one of the most developed in West Asia (World Bank, 2011). The literacy rate for the UAE has jumped from 53.5 percent in 1989 to 91 percent as of 2007. Due to increased government spending in recent years on health care, standards of healthcare are considered generally high in the UAE; according to the WHO, UAE ranked fourth in the world in terms of health care. The life expectancy at birth is 78.5 years. The UAE has ambitious plans which are already under effect to provide mandatory health insurance for all citizens and expatriates (Detrie, 2009). The country has a relatively liberal social climate, due in part to rapid growth in the socioeconomic sector (CIA World Fact Book, 2011).

CHAPTER 2

LITERATURE REVIEW

2A. Suicide Ideation and Suicide Behaviors

Suicidal ideation is defined as the common medical term for thoughts about suicide, which may be as detailed as a suicide plan, without the suicidal act itself; although most people who undergo suicidal ideation do not commit suicide to completion, a considerable proportion do go on to make suicide attempts (Gliatto et al., 1999). There is a wide range of behaviors of suicidal ideation that varies from brief, momentary planning to detailed plans, role-playing, self-harm, and unsuccessful suicide attempts. The suicide attempts may be deliberately constructed to fail or to be discovered by others, or they may be intended to succeed. The Scale for Suicide Ideation (SSI) is a 19-item clinical research instrument designed to quantify and assess suicidal intention. The scale was found to have high internal consistency, moderately high correlations with clinical ratings of suicidal risk, and it is sensitive to changes in levels of depression and hopelessness over time (Beck et al, 1979). The items on the scale attempt to help place the degree of danger to the individual through self-harm by placing his or her behavior on a scale. The scale varies from a wish to die to a desire to die to acting out the wish to die to planning of the contemplated attempts to actually carrying out an attempt to creating a suicide note to inflicting self-harm to concealment of the attempt (Beck et al, 1979).

The Swedish National Council for Suicide Prevention estimates that the ratio of suicides to attempted suicides to serious suicidal thoughts is approximately 1:10:100 (McAuliffe, 2002). The relationship between age and suicidal behavior is extremely important, as studies indicate substantial differences in ratios across age groups; ideation is generally more common in younger age groups, which may suggest developmental issues (Apter, 1997). Despite the higher occurrence of suicide ideation in the young, suicide completion rarely occurs in children under twelve years of age. Studies have shown that the warning signs for suicide ideation and associated behaviors among adolescents vary greatly; some are barely perceptible while others are blatantly obvious. The less perceptible ones may include sleeplessness or changes in sleeping patterns, unexplained changes in weight or appetite, changes in personality or attitude, increased irritability or crying easily, inability to concentrate or think rationally, abrupt changes in appearance, sudden unexpected happiness, and low self-esteem. The more obvious signs include dwindling academic performance, changed relationships, despairing attitude, suicide notes, giving away prized possessions, direct and indirect suicide threats, talking about death, social withdrawal and isolation, increased risk-taking, loss of involvement in activities and interests, heavy use of alcohol or drugs and making final arrangements (Brock et al, 2007).

2B. Gender Differences in Suicide Behaviors

As mentioned previously, suicide attempts and suicide behaviors vary between the genders; generally speaking, suicide attempts are more frequent among females, but rates of completed suicides are higher among males. Typical male suicide attempters usually fall into the following categories: unemployed, never married, living alone; they tend to use violent methods. If drugs are taken as the means of self-harm, it is usually a drug that will succeed in its purpose, such as meprobamate or carbamazepine; many male attempters also have alcohol problems or

dependence (Voros et al, 2004). Female attempters display high odds ratios in the following cases: divorced or widowed, economically inactive, depressed. Female attempters also tend to be repeaters, exhibiting multiple unsuccessful attempts, especially using the method of self-poisoning, mostly with drugs in the benzodiazepine family (Voros et al, 2004). Having a young child is a strong protective factor among females.

Studies suggest that the more frequent acts of deliberate self-harm in females are more often based on non-suicidal motivation. In females, the appeal function of deliberate self-harm, whereby deliberate self-harm is used to communicate distress or to modify the behavior and reactions of other people seems more common; in males, deliberate self-harm is more often associated with greater suicidal intent (Hawton, 2000). Greater suicidal intent, more aggression, better knowledge regarding violent means of self-harm and less concern about bodily disfigurement are all likely explanations for the excess violent suicide in males (Paykel et al, 1974). While studies have repeatedly demonstrated that affective and personality disorders predominate in suicides in both genders, substance misuse disorders are more common in male suicides (Murphy, 2000) and individuals with schizophrenia who carry suicide to completion are also more often male (De Hert & Peuskens, 2000). Eating disorders, however, carry a higher risk of suicide among females (Harris & Barraclough, 1997). The following maps from the WHO show global suicide rates by gender.

Figure 2.1 Map Showing Global Suicide Rates among Females (WHO, 2011)

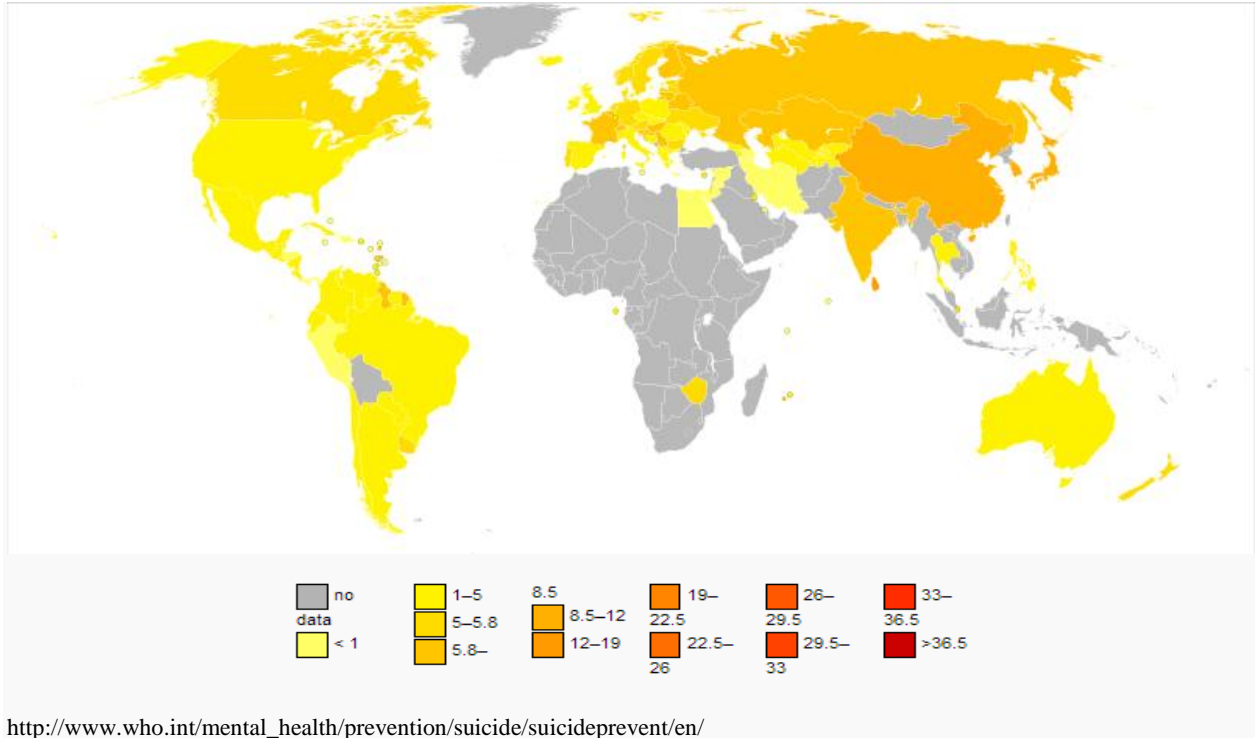
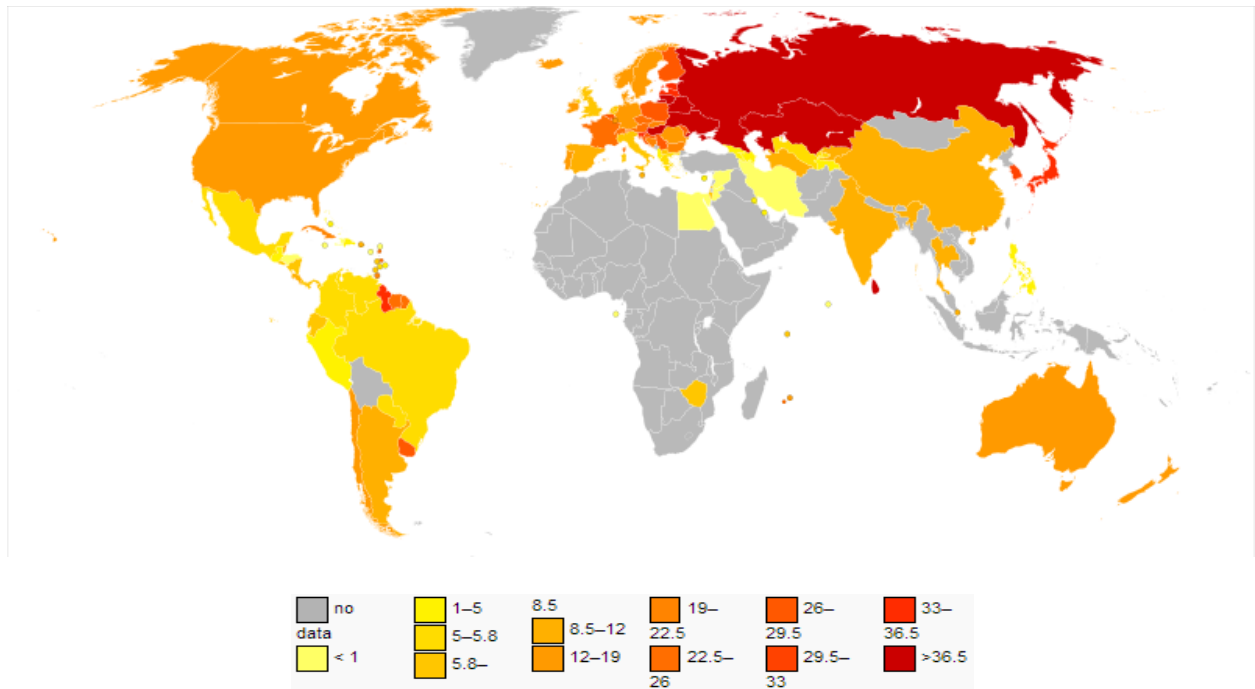


Figure 2.2 Map Showing Global Suicide Rate Among Males (WHO, 2011)



2C. Suicide among Children and Adolescents

Suicide is an increasingly pressing public health issue among youth both in the United States and globally. In a study published in *World Psychiatry* in 2005, the mean suicide rate for adolescents aged 15 to 19 in the 90 countries studied was 7.4 out of 100,000; out of deaths among adolescents in these 90 countries, suicide accounted for 9.1% of total mortalities. Suicide rates were higher in males than in females for every country studied with the exception of China, Cuba, Ecuador, El Salvador and Sri Lanka. In these countries, suicide was the fourth leading cause of death among young males and the third for young females. A rising trend in suicide deaths was observed in the adolescent population as a whole, but especially among young males (Wasserman et. al, 2005). In the United States, suicide is the third leading cause of death for adolescents aged 15 to 19 (Pediatrics, 2000)

While suicide completion is obviously a major public health crisis, suicide ideation and attempts that are not carried to completion also present considerable problems. The most recent statistics released from the CDC reveal that the number of attempted suicides among teenagers increased from 6.3 percent in 2009 to 7.8 percent in 2011. The CDC's Youth Risk Behavior Survey (YRBS) showed that not only did suicide attempts increase among teens, but thoughts of suicide are also on the rise. Of the teens surveyed, 15.8 percent said they had seriously considered attempting suicide and 12.8 percent of youths made a suicide plan (CDC [YRBS] 2011). Cluster suicides, where one suicide triggers many other suicides, are also significantly higher among adolescents than among any other age group (Nagera, 2002).

2D. View of Suicide in Islam

The predominant religion in the EMR is Islam. Since Islam is a religion that governs every aspect of life for its followers, suicide is a topic that is clearly explained within religious

texts. The Quran says, “It is He who giveth life and who taketh it, and to Him shall ye all be brought back (Quran 10:56).” Another verse explains the prohibition of suicide in even clearer terms: “Come, I will rehearse what God hath (really) prohibited you from: Join not anything as equal with Him; be good to your parents; kill not your children on a plea of want- He will provide sustenance for you and for them; come not nigh to shameful deeds, whether open or secret; take not life, which God hath made sacred, except by way of justice and law: thus doth He command you that ye may learn wisdom (Quran 6:151). Additional verses even suggest a punishment for those who take their own lives: “Nor kill (or destroy) yourself: for verily God hath been to you Most Merciful! If any do that in rancor and injustice, soon shall He cast them into the Fire: And easy it is for God (Quran 4:29-30).”

In addition to the Quran, a compilation of works documenting the actions and sayings of the Prophet Muhammad known as the Hadith also illustrate the consequences of committing suicide. In a book of the Hadith known as Bukhari, the Prophet says, “A man was inflicted with wounds and he committed suicide, and so God said: My slave has caused death on himself hurriedly, so I forbid Paradise for him (*Bukhari* Volume 2, Book 23:445).” Another section of the Hadith states “And if somebody commits suicide with anything in this world, he will be tortured with that very thing on the Day of Resurrection (*Bukhari* Volume 8, Book 73:3).” All of the examples cited above clearly show that suicide is a major sin in Islam. The extremely low rates of suicide in the predominantly Islamic EMR may be the result of the prohibition placed on suicide in Islam; subsequently, the prohibition also causes an inevitable taboo in the culture regarding matters dealing with suicide, which may be a reason for underreporting of cases and a general dearth in studies on the subject.

CHAPTER 3

METHODS

3A. Source of Data

The source of the data that is analyzed in this study comes from the Global School-Based Student Health Survey (GSHS). The purpose of the GSHS is to provide accurate data on protective factors and health behaviors among students aged 13 to 15 years in ten key areas. The survey uses a standardized questionnaire as well as a standardized scientific sample selection process; the questionnaire can be administered during one class period. The ten areas the questionnaire covers include alcohol use, dietary behaviors, drug use, hygiene, mental health, physical activity, protective factors, sexual behaviors, tobacco use, and violence and unintentional injury. Publicly available data includes country specific fact sheets, questionnaires, reports and public use data files. The results of the survey are helpful in aiding the participating countries in developing priorities, establish subsequent programs, and advocate for school health and youth health programs and policies. In the most recent 2012 survey, datasets are available for 55 countries, including those from regions in Africa, the Americas, South-East Asia, Europe, the Eastern-Mediterranean, and the Western Pacific. The administration of the survey uses a two-stage cluster sample design in which schools are first selected that have probability proportional to their enrollment size; the next stage randomly selects classes, and the selected classes participate in the survey.

The GSHS is developed and funded by the WHO, and is conducted in collaboration with other world and national health organizations, including the United Nations Educational, Scientific, and Cultural Fund (UNESCO), the United Nations Children's Fund (UNICEF), the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the Centers for Disease Control and Prevention (CDC). This study used data from the GSHS from four countries in the EMR.

These countries include Jordan (N=2178, 2007), Lebanon (N=5109, 2005), Morocco (2615, 2006), and the United Arab Emirates (N=15634, 2005). The table below describes the response rates and participants by gender distribution and age for the participating countries.

Table 3.1 GSHS EMR Country Characteristics

	Jordan	Lebanon	Morocco	UAE
Year	2007	2005	2006	2005
Total Sample Size	2197	5115	2670	15790
School Response Rate	100%	92%	100%	97%
Student Response Rate	99.8%	96%	84%	91%
Overall Response Rate	99.8%	88%	84%	89%
Boys (Wtd%)	50.5%	47.7%	54.68%	48.3%
Girls (Wtd%)	49.5%	52.3%	45.32%	48.4
Age=<12(Wtd%)	1.4%	---	---	15.7%
Age=13-15 (Wtd%)	73.9%	73.5%	100%	67.0%
Age>=16 (Wtd%)	24.6%	---	---	17.2%

3B. Measures

Although the GSHS covers a wide variety of measures and protective and risk factors, for the purposes of this study, eight measures were examined and analyzed. Prior to the secondary analysis, approval was granted by the Georgia State University Institutional Review Board. This study utilized the publicly available GSHS datasets to conduct a secondary logistical regression analysis of eight risk factors and their association to suicide ideation among school-aged boys and girls in Jordan, Lebanon, Morocco and the UAE. The four countries selected in the analysis all had complete national datasets, and they represent a good variety of characteristics and descriptive traits from the EMR, including varying degrees of liberality in thought, religion and culture, as well as varying levels of GDP and general climates of economic success among the region. The eight risk factors include being the victim of bullying, alcohol use, drug use, having no close friends, feeling sad, missing school, physical fighting, and going hungry; subsequently, the outcome variable is suicide ideation. Brief descriptions of the outcome variable and associated risk factors used in the study are outlined below.

Table 3.2 Description of Risk Factors

Risk Factors	Description
Bullying Victimization	Students who were bullied on one or more days in the past 30 days.
No Close Friends	Students who have no close friends.
Feeling Sad	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.
Alcohol Use	Students who had at least one drink containing alcohol on one or more days during the past 30 days.
Illicit Drug Use	Students who used drugs during their life.
Missing School	Students who missed classes or school without permission on one or more days during the past 30 days.
Physical Fighting	Students who were in a physical fight one or more times during the past 12 months
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.

Outcome Variable	Description
Suicide Ideation	Percentage of students who seriously considered attempting suicide over the past 12 months.

Each of the risk factors analyzed in the study were chosen for a specific reason. Bullying victimization, especially childhood bullying victimization, has been identified as a risk factor for later depression and suicidal ideation, especially among males (Brunstein et al, 2008). Bullying victimization has also been shown to contribute uniquely to adjustment problems in children, as well as behavior and school-related problems and increased internalized problems and unhappiness (Arseneault, 2006). Childhood victims of bullying also displayed less pro-social

behavior (Arseneault, 2006) which relates closely to another risk factor for suicidal ideation, having no close friends. Living alone or having a lack of close friends are both markers for social isolation, and social isolation directly leads to feelings of loneliness, which has been proven to be one of the major risk factors for suicide ideation and parasuicide in both men and women (Stravynski, 2011). Another study has shown that children who have no close friends are at a greater risk for depression and suicidal thoughts (Rao et al, 1993). The third risk factor, feeling sad or hopeless, is also closely related to the previously discussed risk factors. Feeling sad or hopeless is one of the key risk factors used in diagnosing suicidal tendencies (National Alliance on Mental Illness [NAMI], 2012). According to NAMI, signs of depression and suicide risk include changes in personality such as becoming sad, withdrawn, irritable, anxious, apathetic or indecisive. Another risk factor mentioned by NAMI was having no hope for the future. Depressive symptoms have been shown to be the strongest correlates and predictors for suicide ideation across both sexes (Kandel et al, 1991).

The subsequent two risk factors, alcohol use and illicit drug use, fall into the category of substance abuse. A psychological autopsy of 20 adolescents aged 12 to 19 years who had committed suicide revealed that over 70% of the children had a history of drug or alcohol use (*Psychological Autopsy*, 1985). According to another study, individuals with a substance abuse problem are six times more likely to report a lifetime suicide attempt than those without a substance use disorder (Ilgen et al, 2011). The association between alcohol use and suicide ideation is not only limited to adults. According to another study, alcohol use among adolescents, particularly preteen alcohol use initiation, is an important risk factor for both suicide ideation and suicide attempts among both boys and girls (Swahn, 2007).

The sixth variable, missing school, was chosen because repeated absences from school may be linked to the other risk factors being analyzed, such as bullying victimization and drug or alcohol use. A study of students from the United Kingdom that was part of the European School Project on Alcohol and Other Drugs (ESPAD) showed that school truancy rates rose with the usage of cigarettes, alcohol and other drugs (Miller, 1998). Bullying was the primary reason given by twenty percent of students as their major reason for persistent absenteeism from school (Reid, 1983). Another factor that relates closely with bullying and its associated violence is physical fighting. In a study that adjusted for socio-demographic characteristics and the presence of a mood, anxiety or disruptive disorder, a significant association was found between suicide ideation and physical fighting (King et al, 2001).

The last variable and risk factor analyzed in the study is hunger, and it is defined as students who went hungry most of the time or always during the past 30 days because there was not enough food in their home. Hunger was chosen as a variable because it is an important indicator of poor health, academic, and psychosocial outcomes (Alaimo et al, 2002). Previous studies have shown that family food insufficiency, but not low family income, is positively associated with suicide symptoms in adolescents living in the United States (Alaimo et al, 2002). Hunger was also found to be a significant risk factor for suicide in the developing world (Swahn et al, 2012).

Alcohol use is prohibited in two of the countries in the study, namely the UAE and Jordan; subsequently, illicit drug use data was also not available from both of these countries. Islam prohibits the consumption of alcohol and mind-altering drugs, so use of either is extremely taboo amongst all Muslim countries. Data on alcohol and illicit drug use is available from Lebanon and Morocco for various reasons; Lebanon has a higher non-Muslim population than

the other countries, and Morocco is slightly more culturally liberal than the other countries.

Prevalence of each of the risk factors is shown in the table below for each of the EMR countries studied. Lebanon had the highest rate of alcohol use among students, with 19.52% of students, or two out of every ten students, having consumed at least one drink containing alcohol in the last 30 days. In both Morocco and Lebanon, students in private schools were more likely to report alcohol use than students in public schools. The illicit drug use the students were asked about included marijuana, cocaine, heroin, ecstasy, and medical tranquilizers. The prevalence of each of the variables is outlined in the table below.

Table 3.3 Prevalence of Risk Factors (Variables Analyzed)

Variable Name	Jordan N=2178 Wtd %	Lebanon N=5109 Wtd%	Morocco N=2670 Wtd %	UAE N=15634 Wtd%
Bullying Victimization	35.54%	29.99%	28.15%	19.13%
Alcohol Use	N/A	19.52%	4.91%	N/A
Illicit Drug Use	N/A	3.46%	7.95%	N/A
No Friends	8.16%	3.48%	10.96%	6.40%
Feeling Sad	38.71%	37.54%	39.18%	35.24%
Missing School	39.11%	15.31%	32.74%	31.18%
Physical Fighting	46.71%	45.98%	43.76%	43.17%
Hunger	14.14%	3.00%	8.94%	9.42%

Of the eight risk factors analyzed in the study, physical fighting had the highest overall prevalence for all the countries. Jordanian students had the highest prevalence of being involved in physical fighting, followed by Lebanese students, then students in Morocco and the UAE. The second risk factor with the highest prevalence was feeling sad, and Moroccan students had the highest percentage for this risk factor. Lebanese students had a significantly lower percentage of missed school days compared to students from the other countries. Bullying victimization also

had a relatively high prevalence across all four countries, with the highest percentage in Jordan and the lowest percentage in the UAE. Alcohol and illicit drug use data was not available for Jordan and the UAE. Having no friends was the least prevalent risk factor, and Moroccan students had the highest percentage of having no friends. The following tables show the prevalence of suicide ideation among all students, as well as the prevalence of all eight risk factors for all students. The prevalence is also shown for all eight risk factors stratified by gender for all four countries.

Table 3.4 Prevalence of Suicidal Ideation (Outcome Variable)

	Jordan		Lebanon		Morocco		UAE	
All Students	24.72%		19.57%		17.83%		16.15%	
Stratified by Gender	Males	Females	Males	Females	Males	Females	Males	Females
	11.90%	12.82%	8.89%	10.68%	8.87%	8.96%	8.39%	7.76%

Table 3.5 Prevalence of Risk Factors Stratified by Gender

Variable Name	Jordan		Lebanon		Morocco		UAE	
	N=	Wtd%	N=5109	Wtd%	N=2615	Wtd %	N=15634	Wtd%
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Bullying Victimization	45.6±3.8	37.1±8.3	38.9±2.8	29.4±3.0	41.3±3.2	25.0±3.4	24.5±1.7	17.2±1.5
Alcohol Use	N/A	N/A	28.5±6.1	12.3±3.4	5.5±2.7	1.6±0.9	N/A	N/A
Illicit Drug Use	N/A	N/A	5.5±1.5	1.6±0.6	9.3±3.1	4.3±0.9	8.2	1.8
No Friends	8.7±1.7	7.4±2.5	3.3±1.0	3.0±0.8	8.3±2.3	12.4±2.4	6.6±0.8	6.2±0.7
Feeling Sad	9.6±1.8	19.1±4.6	7.1±1.4	16.6±2.1	11.8±2.3	20.1±2.4	32.0±1.6	38.5±2.3
Missing School	40.1±3.5	33.8±6.8	20.1±2.5	10.0±1.4	37.3±3.9	22.2±2.9	34.0±2.3	28.3±3.2
Physical Fighting	65.1±4.8	29.9±6.3	65.2±2.9	27.6±2.2	63.3±3.9	20.3±3.2	56.9±1.6	29.5±2.0
Hunger	13.0±3.0	12.8±3.2	3.1±0.8	2.4±0.7	10.7±3.5	7.4±1.2	10.0±0.8	8.9±1.0
Suicide Ideation	15.5±2.1	17.4±3.3	14.0±1.6	17.6±2.1	11.2±3.3	14.5±3.1	13.4±1.5	12.5±1.1

3C. Statistical Analysis

A bivariate association analyses was performed between the eight risk factors and suicidal ideation. The results were stratified by gender and age. The students were categorized in one of four age groups; thirteen and under, fourteen, fifteen and sixteen and over. The surveys from each of the four EMR countries were analyzed using SAS 9.1 and SUDAAN 10 statistical analysis software. Weighted estimates were produced as a result of each analysis, and for the variables that were missing more than five percent of the total amount of data, the missing-indicator method was used. The missing-indicator method employs a dummy category to stand in for the missing data; thus, nearly all the participants are included in the analyses as opposed to omitting them using a list-wise deletion. The odds ratios computed are therefore interpreted as the risk for the outcome of suicide ideation with the missing data being relative to the reference category. Weighted estimates were produced, and no statistical findings were reported for the missing data alone. A multivariate logistical regression analysis was performed that adjusted for suicidal ideation by gender and age.

CHAPTER 4

RESULTS

4A. Prevalence of Suicide Ideation

Among the four EMR countries studied, Jordan had the highest prevalence of suicide ideation, and the UAE had the lowest. The results for all four EMR countries are shown in the following table

Table 4.1 Prevalence of Suicidal Ideation Stratified by Gender

	Jordan		Lebanon		Morocco		UAE	
All Students	24.72%		19.57%		17.83%		16.15%	
Stratified by Sex	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	11.90%	12.82%	8.89%	10.68%	8.87%	8.96%	8.39%	7.76%

The overall prevalence of all the risk factors varied across the countries. There was a certain degree of variation among boys and girls and suicidal ideation across all four countries, as shown in figure 4.2, but table 4.2 shows that the only country where the difference was statistically significant was in Morocco, where the odds ratio was 0.8 with a confidence interval

ranging between 0.65 and 0.97. When comparing the prevalence of the eight risk factors across the four countries, Jordan had the highest overall prevalence across all the risk factors with the exception of having no friends and feeling sad. Morocco had the highest prevalence for both of these risk factors. Of the two countries that reported data on alcohol and illicit drug use, Lebanon had a much higher prevalence of alcohol use as compared to Morocco (19.52 percent for Lebanon versus 4.91% for Morocco). In contrast, however, Morocco had a higher level of illicit drug use than Lebanon (3.46% for Lebanon versus 7.95% for Morocco). The country with the lowest overall prevalence of most of the risk factors was the UAE, with the lowest prevalence of bullying victimization (19.13%) across all four countries, the lowest prevalence of students reporting feeling sad (35.24%), and the lowest prevalence of physical fighting (43.17%). Lebanese students reported missing the least amount of school days with only 15.31%, which is approximately half as much as students from the other countries. Students from the other countries reported much higher levels of missing school, with Jordanian students reporting at 39.11%, Moroccan students reporting at 32.74%, and students from the UAE reporting at 31.18%. Bullying victimization was the highest in Jordan, and the lowest in the UAE. One of the risk factors with the widest range in prevalence across the four countries was hunger; Jordanian students reported the highest prevalence (14.14%), while Lebanese students reported the lowest prevalence (3.00%), with Morocco and the UAE falling in between at 8.94% and 9.42% respectively.

The prevalence of the risk factors varied by gender among the four countries as well, as is shown in Table 3.5. Boys had a higher prevalence of bullying victimization across all four EMR countries. Illicit drug use and alcohol use was also more prevalent among boys than in girls in the two countries that reported data on the two risk factors, Lebanon and Morocco. More boys

than girls reported having no friends in Jordan, Lebanon and the UAE; subsequently, more girls than boys reported having no friends in Morocco. The prevalence of feeling sad was much higher among girls as compared to boys in all four EMR countries. Missing school was more prevalent among boys than among girls in all four countries, as well as involvement in physical fighting. Boys also reported a higher prevalence of hunger than girls across all four countries studied. Suicidal ideation was more prevalent among girls than in boys in all the countries except the UAE, where it was more prevalent among boys than in girls.

Figure 4.1

Prevalence of Suicidal Ideation among All Students across All Countries

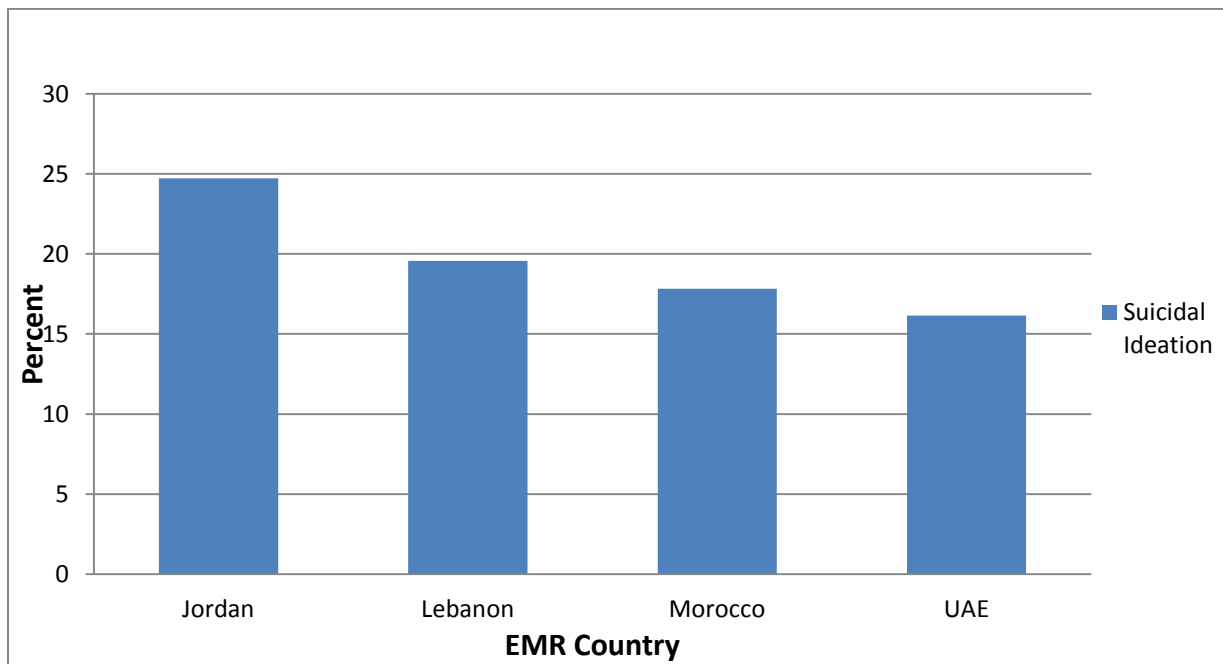


Figure 4.2

Prevalence of Suicidal Ideation for Each Country stratified by Gender

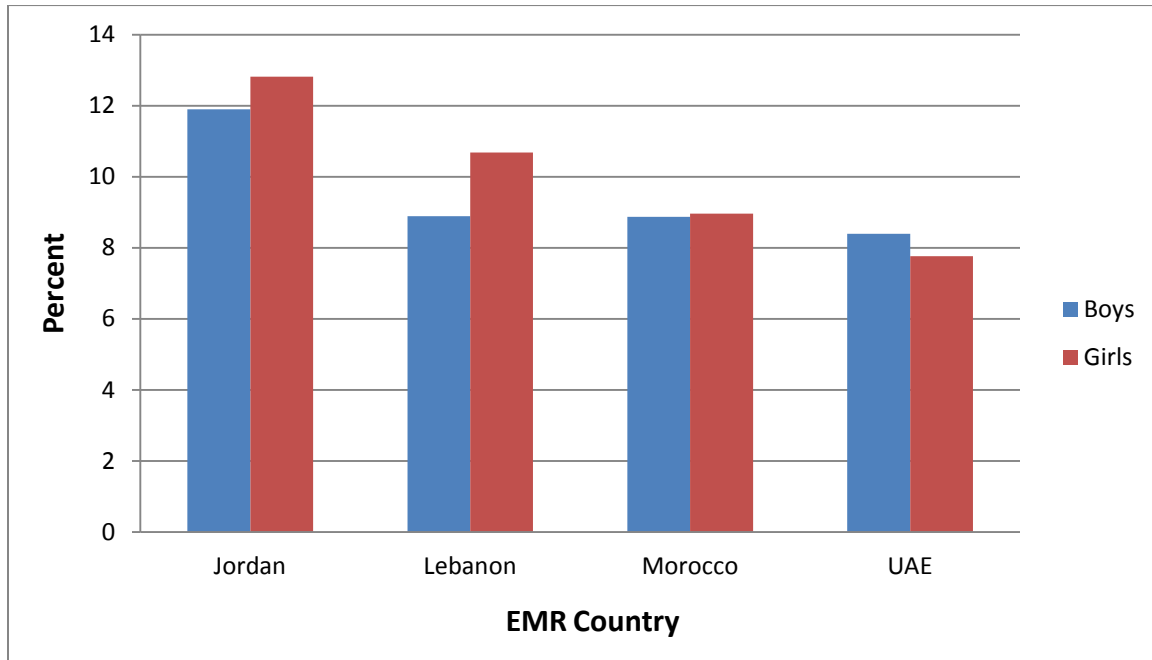


Figure 4.3

Prevalence of Risk Factors across Four EMR Countries

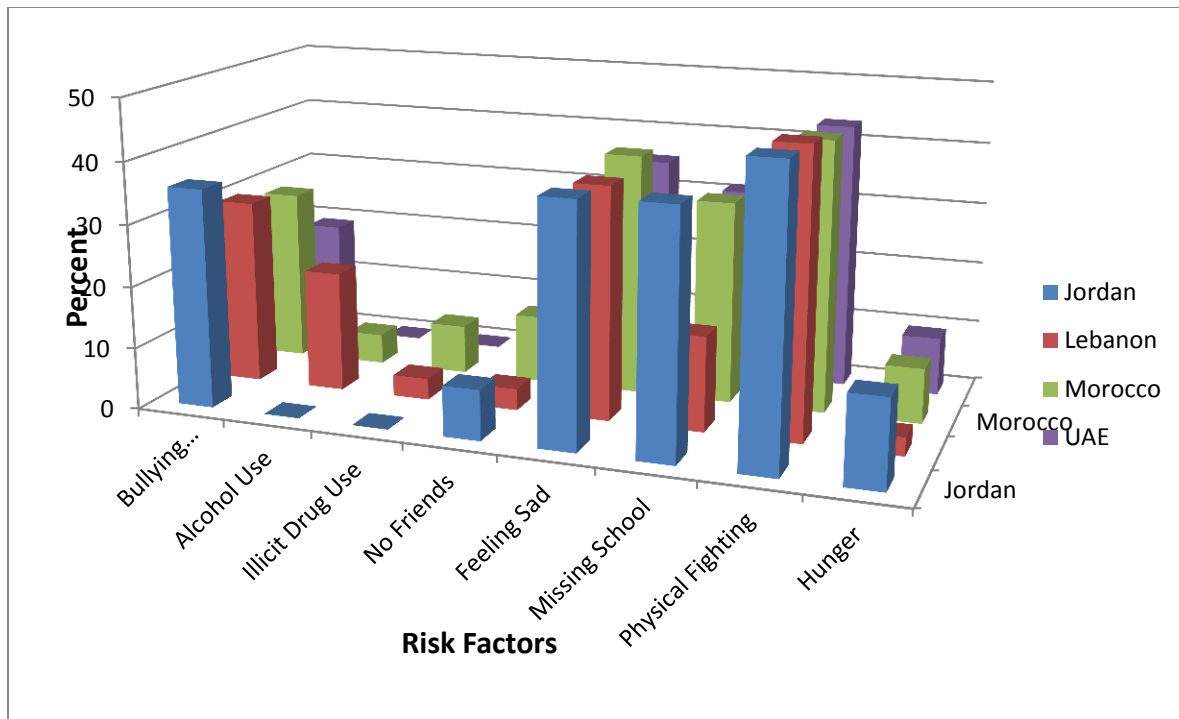


Figure 4.4

Prevalence of Risk Factors in Jordan

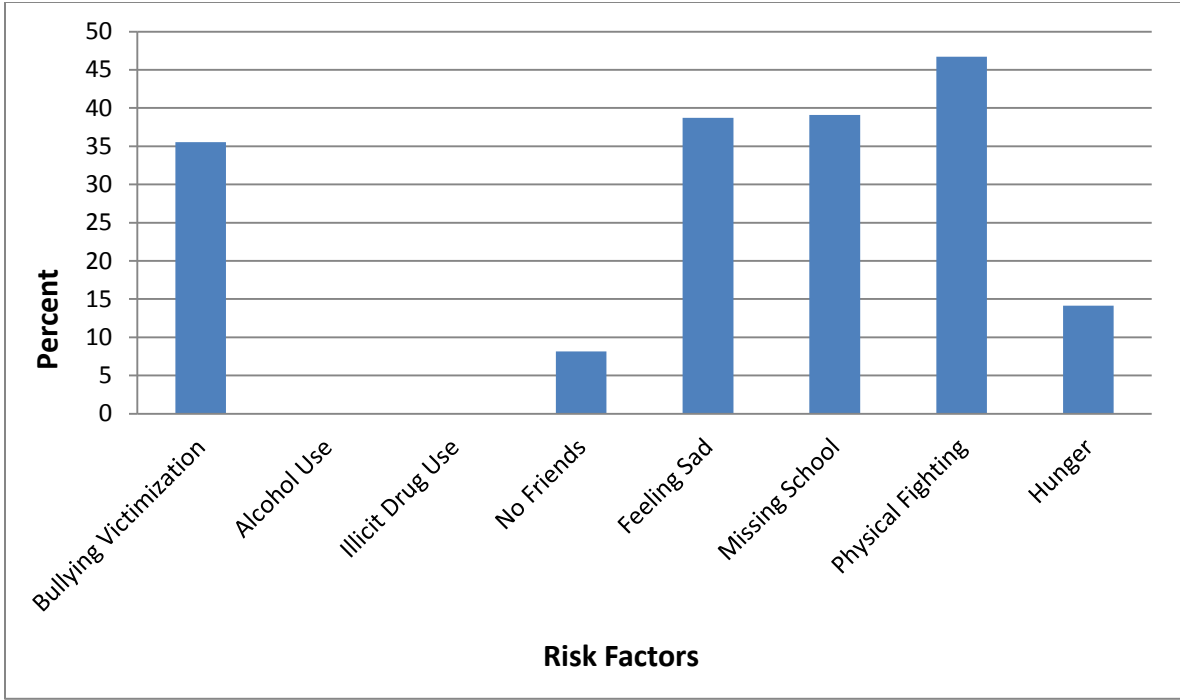


Figure 4.5

Prevalence of Risk Factors in Lebanon

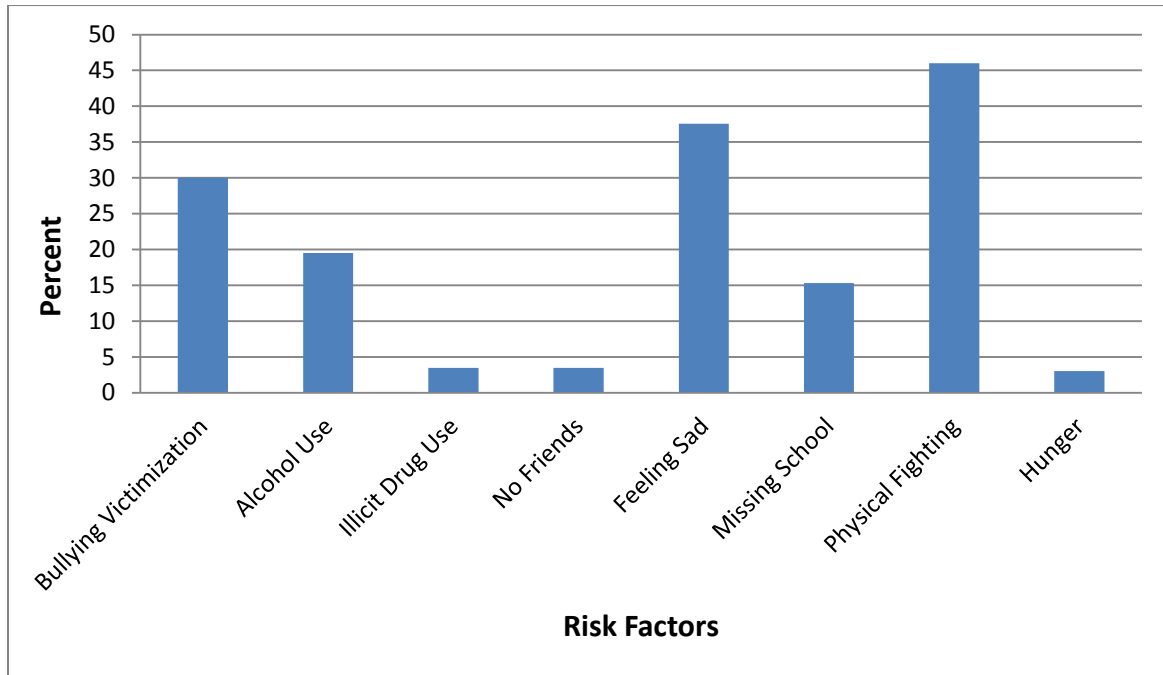


Figure 4.6

Prevalence of Risk Factors in Morocco

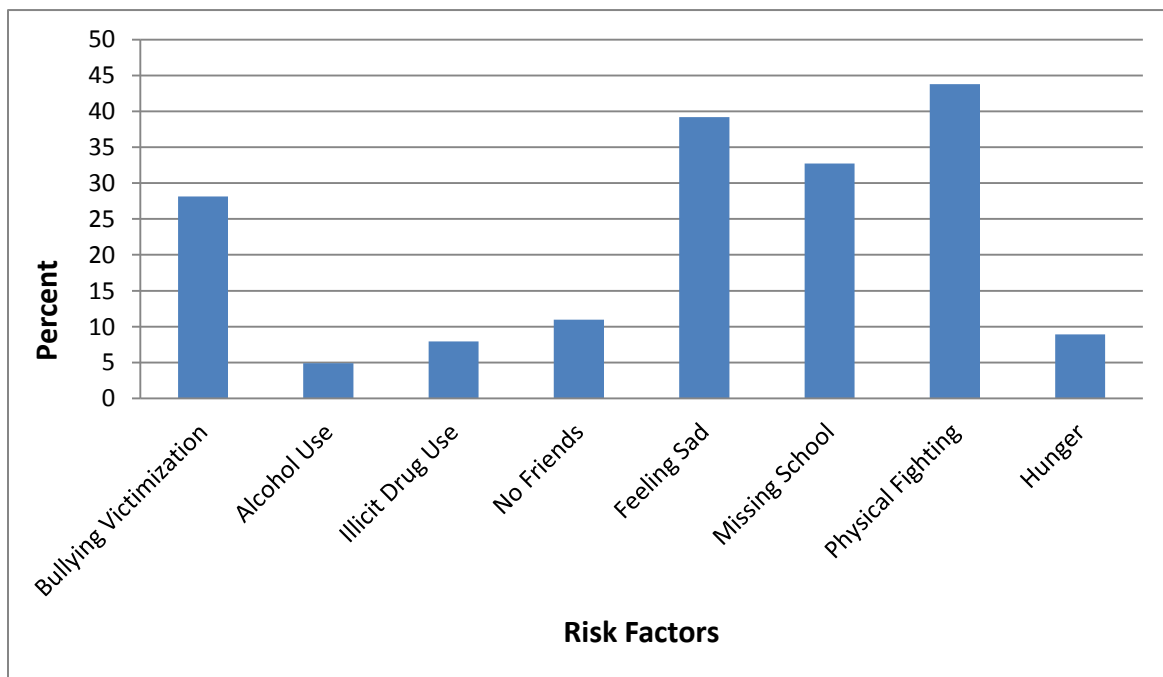


Figure 4.7

Prevalence of Risk Factors in UAE

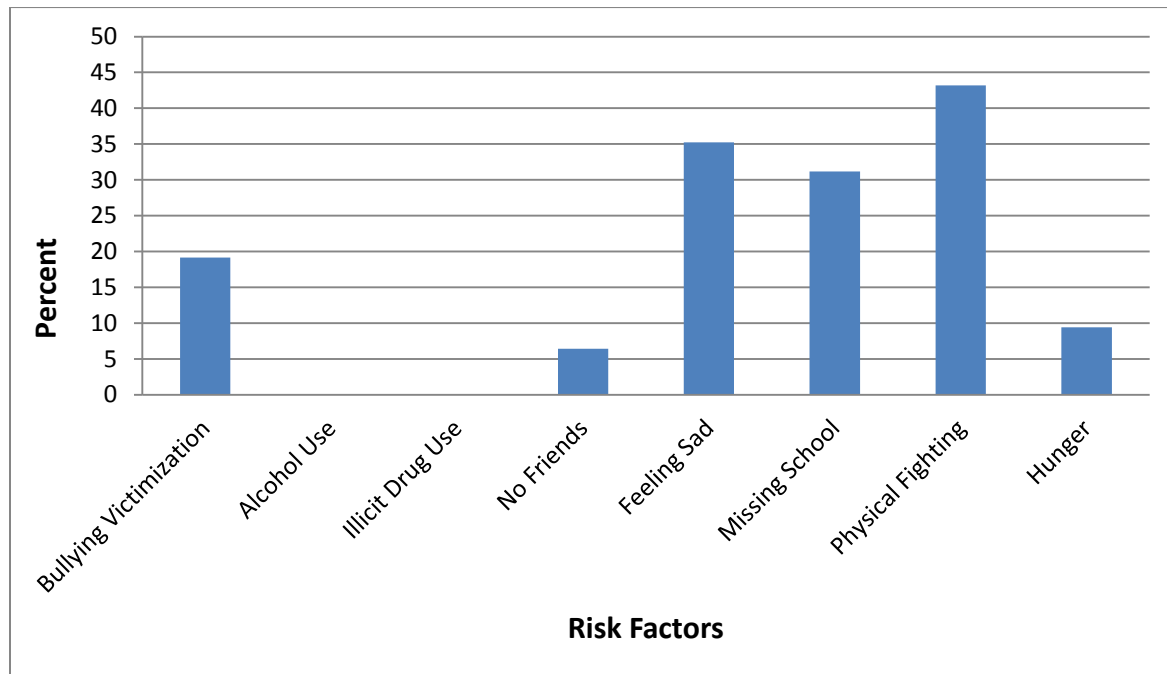


Table 4.2

Bivariate Associations between Demographic Characteristics and Suicidal Ideation among Students in Four Eastern Mediterranean Region Countries Stratified by Gender

Risk Factors	Jordan		Lebanon		Morocco		UAE	
	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)	%	OR (95%CI)
Boys	11.9	0.93	47.6	0.89	8.8	0.80	8.3	1.11
	0	(0.70-1.23)	9	(0.77-1.03)	7	(0.65-0.97)	9	(0.93-1.31)
Girls (Reference Category)	12.8	1.00	52.3	1.00	8.9	1.00(1.00	7.7	1.00
	2	(1.00-1.00)	1	(1.00-1.00)	6	-1.00)	6	(1.00-1.00)

Table 4.3**Percentage of Students Reporting Each Risk Factor**

Risk Factor	Jordan (%)	Lebanon (%)	Morocco (%)	UAE (%)
Bullying	10.97	29.99	6.25	5.22
Victimization				
Alcohol Use	---	19.52	1.92	---
Illicit Drug Use	---	3.46	2.58	---
No Friends	3.85	3.48	3.65	2.22
Feeling Sad	15.25	37.54	12.05	9.69
Missing School	11.93	15.31	7.76	7.01
Physical	12.64	45.98	8.56	9.13
Fighting				
Hunger	5.14	3.00	2.07	2.39
Suicide Ideation	24.93	19.54	17.77	16.20

Table 4.4**Multivariate Logistic Regression Analyses of the Associations between Risk Factors and Suicidal Ideation among Students in Four EMR Countries**

Risk Factors	Jordan Adj. OR (95% C.I.)	Lebanon Adj. OR (95% C.I.)	Morocco Adj. OR (95% C.I.)	UAE Adj. OR (95% C.I.)
Boys	0.93 (0.70-1.23)	0.75 (0.64-0.89)	0.60 (0.37-0.97)	0.94 (0.77-1.15)
Girls (Reference Category)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)
≤13	0.81 (0.50-1.30)	0.63 (0.49-0.80)	0.91 (0.48-1.72)	0.79 (0.61-1.03)
14	0.85 (0.61-1.20)	0.74 (0.58-0.95)	0.68 (0.40-1.16)	0.84 (0.66-1.08)
15	0.81 (0.63-1.04)	0.96 (0.75-1.23)	0.92 (0.60-1.39)	0.82 (0.64-1.07)
≥16 (Reference Category)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)
Bullying Victimization	1.43 (0.96-2.12)	1.75 (1.46-2.10)	1.51 (1.03-2.20)	1.93 (1.67-2.22)
Alcohol Use	---	1.43 (1.13-1.82)	2.31 (1.15-4.65)	---
Illicit Drug Use	---	4.48 (2.83-7.08)	1.47 (1.10-1.97)	---
No Friends	3.30 (1.89-5.77)	3.43 (2.41-4.87)	2.36 (1.54-3.62)	2.91 (2.31-3.66)
Feeling Sad	3.40 (2.76-4.19)	3.40 (2.75-4.21)	3.81 (2.37-6.11)	3.33 (3.00-3.70)
Missing School	1.45 (1.10-1.91)	1.29 (1.01-1.64)	1.41 (0.98-2.04)	1.44 (1.27-1.64)
Physical Fighting	1.19 (0.82-1.73)	1.18 (0.99-1.40)	1.25 (0.94-1.66)	1.60 (1.38-1.85)
Hunger	1.51 (1.06-2.15)	1.52 (0.94-2.45)	1.34 (0.78-2.31)	1.43 (1.21-1.68)

Chapter 5

Discussion

5A. Correlates of Suicidal Ideation

As mentioned previously, bivariate associations were computed for age, sex, and eight risk factors for all four countries in the study. The risk factors included bullying victimization, alcohol use, illicit drug use, having no friends, feeling sad, missing school, involvement in physical fighting, and hunger. The outcome variable was suicidal ideation. Jordan had the highest overall prevalence of suicide ideation for all students (24.72%), followed by Lebanon (19.57%), then Morocco (17.83%) and finally the UAE (16.15%). All of the countries, with the exception of the UAE, reported a higher prevalence of suicide ideation among girls than among boys. Surprisingly, the UAE reported a higher prevalence of suicide ideation among boys than girls. The only country where gender was significantly associated with suicide ideation, however, was Morocco.

When the data was stratified for age, a significant association was found for students aged 13 and under in Lebanon (O.R. = 0.48, 95% C.I. = 0.38-0.60) and the UAE (O.R. = 0.63, 95% C.I. = 0.50-0.78). Suicidal ideation was found to be significant among 14 year olds across all countries with the exception of Jordan. Fourteen year olds in Lebanon had an especially high percentage of suicide ideation (25.9%) that was found to be significant (O.R. = 0.59, 95% C.I. = 0.47-0.73). While rates of suicide ideation were lower in Morocco (3.30%) and the UAE (3.67%), they were found to be significant as well. Suicide ideation was not found to be significant among students aged 15 years and students aged 16 years and older in any of the countries studied.

For the countries reporting data on alcohol use and illicit drug use, specifically Lebanon and Morocco, both risk factors had a significant association with suicide ideation in both countries. Although alcohol use was much higher in Lebanon (19.52%) than in Morocco (4.91%), it was significant in both Lebanon (Adj. O.R. = 1.43, 95% C.I. = 1.13-1.82) as well as in Morocco (Adj. O.R. = 2.31, 95% C.I. = 1.15-4.65). Having no friends and feeling sad were significantly associated with suicide ideation across all four countries. Bullying victimization was significantly associated with suicide ideation in all the countries except Jordan; additionally, missing school was significantly associated with suicide ideation in all the countries except Morocco. Hunger was only found to be significantly associated with suicide ideation in Jordan (Adj. O.R. = 1.51, 95% C.I. = 1.06-2.15) and the UAE (Adj. O.R. = 1.43, 95% C. I. = 1.21-1.68). Physical fighting was only significantly associated with suicide ideation in the UAE (Adj. O.R. = 1.60, 95% C.I. = 1.38-1.85). All of the risk factor variables analyzed were significantly associated with suicide ideation in at least one of the four EMR countries in the study. Physical fighting was the least commonly associated correlate to suicidal ideation across the four EMR countries. Having no friends and feeling sad were the most commonly associated correlates to suicide ideation across all four EMR countries in the study. Alcohol use and illicit drug use were significantly associated with suicide ideation in all the countries that reported data on the two correlates. The figures and tables below show the results of the bivariate and multivariate logistical regression analyses for all right risk factors and the outcome variable of suicide ideation.

5B. Discussion

The purpose of this study was to examine and assess the relationships between risk factors for suicidal ideation among students aged 12 to 16 in four EMR countries. In order to achieve the intended purpose, secondary logistical regression analyses of eight correlates and an outcome variable of suicide ideation were conducted of publicly available data collected by the GSHS. The analysis showed the strength of the relationships between correlates and the outcome variable, as well as the prevalence of each variable among the student populations of the four countries; additionally, the results were stratified by gender and age. The primary goal of the researchers in choosing the area of study was to assess an area of study that is extremely understudied, namely suicide in the EMR, and especially suicide and suicide-related behaviors among the youth in the EMR. Another objective of the research was to provide easily understandable information regarding a very important topic and to describe the epidemiological features of suicide ideation among youth in the EMR. The countries chosen for the analysis were intended to provide an accurate representation of the area in geographical, socio-economic, religious, and cultural terms; thus, the four countries vary across the spectrum of cultural and religious liberality, geographical location, and economic status. The ultimate goal of the research conducted in this study is to provide a resource for study on mental health and suicide in an area where these topics are often neglected or understudied, as well as to increase knowledge, understanding and awareness on the importance of these topics in the EMR region.

Among the four countries in the study, Jordan had the highest prevalence of suicide ideation among all students (24.72%), followed by Lebanon (19.57%), then Morocco (17.83%), and finally the UAE (16.15%). These rates are higher than or equivalent to suicide rates in the United States (16.8%), in spite of major cultural differences between the EMR countries and the

United States (Cash et al, 2010). When compared to Western European countries, such as Ireland (12.3%), Norway (10.9%), France (14.2%), United Kingdom (15.2%), Spain (12.5%) and Germany (15.62%), the rates of suicide ideation among youth in the EMR are significantly higher; rates among Eastern European countries were similar to rates among the EMR countries (Wasserman et al, 2005). Rates among Latin American countries were usually lower than the rates in the four EMR countries studied. Argentina (16.1%), Costa Rica (10.2%) and Guatemala (13.8%), for example, had suicide ideation rates that were lower than any of the rates from the four EMR countries studied. A few Latin American countries, such as Peru (19.5%), had comparable rates to the countries in the study (WHO, 2011). Asian countries, for the most part, also had lower rates of suicide ideation among youth than the EMR countries in the study. Thailand (8.5%), Indonesia (4.0%), Sri Lanka (9.9%), China (14.3%) and the Philippines (14.8%) all had lower rates than the four EMR countries analyzed in the study (WHO, 2011). Rates of suicide ideation among certain African countries were higher than the countries in the study. In particular, the prevalence of suicide ideation in Zambia (31.9%) and Kenya (27.9%) was higher than in the EMR countries (Palmier, 2011).

According to a 2010 study by Cash and Bridge, the major risk factors for suicide among adolescents include a previous suicide attempt, psychiatric or personality disorders, impulse aggression, substance abuse, availability of lethal means, feelings of hopelessness, a family history of depression or suicide, loss of a parent to death or divorce, family discord, physical and/or sexual abuse, lack of a support network, poor relationships with peers or parents, and dealing with homosexuality in an unsupportive social environment (Cash et al, 2010). Some of these risk factors were included in the study, such as substance abuse, physical violence, poor

relationships with peers, and feelings of sadness and hopelessness. Other risk factors were also included, such as missing school and hunger.

Among the risk factors analyzed, bullying victimization, physical fighting and feeling sad had the highest prevalence across all four countries. The risk factors that had a significant association to suicide ideation across all four countries were having no friends and feeling sad. Jordan had the highest prevalence of suicide ideation among the countries studied, and it also has the lowest GDP and the highest prevalence of hunger. Jordan also has the youngest median age (22.4 years) among the four countries and the highest percentage of people under 15 years of age (34.9% of the general population), as well as the highest rate of unemployment among youth ages 15 to 24 years of age. All of these factors may contribute to a climate that poses an increased risk for suicide ideation among the school-age population. Previous studies have shown that low socioeconomic status contributes significantly to an increased suicide risk (Qin et al, 2003). The large population of youth in the country may also contribute to “cluster suicide” type behaviors that are especially prevalent among adolescent populations that are highly impressionable and susceptible to peer pressure (Gould et al, 2001). The country with the highest standard of living in the study was the UAE. Although the UAE had the lowest rates of suicide ideation, the associations between all of the risk factors and suicide ideation were significant among students in the UAE. The significant associations may indicate that in countries that have a higher socioeconomic status and per capita income, as well as higher levels of education and increased access to healthcare, those students who respond positively to being affected by the risk factors may be at an increased risk for suicide ideation than students in countries with a poorer economic climate and lower quality of life in general. In other words, adolescents living in countries that have an overall higher socioeconomic status may show higher sensitivity when

dealing with the risk factors associated with suicide ideation as opposed to adolescents living in less economically successful countries. Male students were significantly more likely than female students to use illicit drugs in both Morocco and Lebanon.

Out of all four of the EMR countries in the study, Jordanian students had the highest rates of going hungry because not enough food was available in their homes, in spite of the fact that Jordan has the second highest GDP out of all four of the countries. A possible reason for this may be the high number of Palestinian refugees in Jordan, one of the highest among all EMR countries, which causes the country to have a substantial gap between the middle and upper income Jordanians and those at or below the poverty line. The other risk factors analyzed relate to mental health and violence and unintentional injury.

5C. Associations of Correlates and Suicide Ideation across All Countries

The eight correlates of suicide ideation examined in the study included bullying victimization, alcohol use, illicit drug use, having no friends, feeling sad, missing school, physical fighting and hunger. Additionally, suicide ideation associations were examined for different age groups and for the two genders. Boys were less likely than girls to have thoughts of suicide among all four countries in the EMR, although the rates were very close for the UAE and Jordan. Among the four countries in the study, gender had a significant association to suicide ideation in Lebanon and Morocco. In Lebanon, boys were 0.75 times less likely than girls to have thoughts of suicide, and boys in Morocco were 0.6 times less likely than girls to have thoughts of suicide. Lebanon was the only country to have a significant association for suicide ideation among students aged 13 and younger and students 14 years of age. Bullying victimization proved to be statistically significant in three of the four countries, namely Lebanon, Morocco and the UAE. Students in the UAE who were bullied were the most likely to have

thoughts of suicide; students who were bullied in the UAE were 1.93 times more likely to exhibit suicide ideation than students who were not bullied.

Only half of the countries in the study provided data on alcohol and illicit drug use. The most likely explanation for this may be because of a more liberal cultural atmosphere in both countries regarding the consumption of alcohol and illicit drugs. Lebanon has the highest non-Muslim population among the countries in the study (about 40% non-Muslim) and Morocco has a very active tourism industry. Since Islam prohibits the use of alcohol and illicit drugs, the more conservative Muslim countries may not collect information on use of these substances, or may not make the information publicly available. Regardless, for both of the countries that provided data on alcohol and illicit drug use, both risk factors proved to have a statistically significant association with suicide ideation among students. Students who consumed alcohol in Morocco had a higher associated risk of suicide ideation (2.31 times more likely to have thoughts of suicide than students who did not consume alcohol) than students who consumed alcohol in Lebanon (1.43 times more likely). The reason for this may be because alcohol use is more socially accepted in Lebanon, where there is a large Christian and Jewish population as opposed to Morocco, which is 99% Muslim. The association between illicit drug use and suicide ideation was especially high for Lebanese students. Students in Lebanon who consumed illicit drugs were 4.48 times more likely to exhibit suicide ideation than students who did not partake of the illicit drugs. Comparatively, students in Morocco who consumed illicit drugs were 1.47 times more likely to exhibit suicide ideation than their peers who did not consume illicit drugs. The Lebanese Integrated Health Education Curriculum includes a discussion on the dangers of alcohol use for students in grades 11 and 12 (WHO, GSHS Full Report, 2011), but perhaps more education is needed in a country where 23.5% of students aged 17 and younger report that they

can easily obtain alcohol from the store without any trouble (WHO, 2011). In Morocco, tobacco use is especially high, with 18.4% of students reporting tobacco use; male students in particular showed extremely high rates of tobacco use, with 29.7% of male students having consumed some form of tobacco at least once in their lives. Nargileh, or hookah, was the most commonly used means of tobacco use, with 19.4% of students reporting use at some point in their lives. Cannabis was consumed by 7.2% of students under the age of 15, and psychotropic drugs were used by 4.3% of students (Omari et al, 2011). In a country with such a high prevalence of illicit drug use, especially of tobacco-based products, education on the harmful effects of illicit drug use may be particularly beneficial to the student population. Additionally, the WHO has recommended that schools in both Morocco and Lebanon, among other EMR countries, become smoke-free, with the prohibition of smoking being enforced for not only students but also for teachers, faculty and staff.

The two risk factors that directly relate to mental health in the study were having no friends and feeling sad, lonely or hopeless. Both of these risk factors proved to have a statistically significant relationship to suicide ideation across all four countries in the study. The rates were pretty similar for both risk factors across all four countries. On average, students in all four countries who had no friends were 3.0 times more likely to have suicidal ideation, and students who felt sad or hopeless were 3.485 times more likely to have suicidal ideation. Missing school was significantly associated with suicide ideation in all of the countries except Morocco. Morocco is also the country with the lowest literacy rate (56.1%) and the lowest school life expectancy (10 years), which may explain why missing school may not be an important indicator of mental wellness among youth in Morocco. Physical fighting, on the other hand, was only significantly associated with suicide ideation in the UAE. Hunger was significantly associated

with suicide ideation in Jordan and the UAE. Both of these countries display a large disparity between the upper and middle-income populations and those living below the poverty line.

5D. Limitations

There are a large number of limitations that occur in any study that involves a secondary analysis of data collected in a widely administered, multi-part survey. For the intents and purposes of this study, a secondary analysis of data collected by the GSHS was conducted. Limitations occur when administering a survey such as the GSHS, such as recall bias, where the respondents may answer a question incorrectly due to a lapse in memory; additionally, the students may have answered the questions incorrectly on purpose or may not have been comfortable answering all of the questions, especially in the more conservative Muslim countries where suicide, drug and alcohol use are topics that are often too taboo to be discussed openly. The definition of suicide may also vary across the EMR countries, where suicide bombing is an issue that is unique among the global arena.

For some of the questions, a large percentage of the answers were missing, which is why the variables with missing data were dichotomized and had an additional category added which was labeled as “missing” so as to include the overall data in the final analysis. Furthermore, the GSHS only surveys students who attend school; thus, for countries with a high population of students who do not attend school, such as Morocco, the results of the study may not paint a complete picture as to suicide ideation among all the youth in the country; that being said, however, the extent to which the sample from Morocco is representative of adolescents in each country limits the ability to generalize in such a manner. Moreover, the study did not analyze other risk factors for suicide ideation, such as diagnosed mental illnesses and familial history of

suicide. Also, alcohol and illicit drug use data was not reported for half of the countries in the study. While the sale and consumption of alcohol and other drugs may be illegal in some EMR countries, it does not mean that alcohol and drugs are not used by any students at all in these countries. Lastly, the datasets used for analysis in the study were from different years for each country, which may lead to certain discrepancies in the administration of each annual survey as well as unaccounted changes in the social, political and economic climates of the countries.

5E. Recommendations

There is a pressing need to acknowledge the need for research in the areas of mental health and suicide and its associated risk factors in the EMR, a region where these topics are overwhelmingly ignored and grossly understudied. Studies on mental health, including those on mental health of the adolescent population, are scarcely available for study, and those that are available also underline the need for further study into this topic in the EMR (Afifi, 2006). There is a need for studies that will aid in the creation and implementation of suicide prevention interventions in the EMR countries, especially among student populations who are highly impressionable to peer-pressure and societal conformity. In an area where suicide is a topic that is often too taboo to report, there is also a need for accurate studies that provide truthful reporting of data on suicide statistics. Many suicide deaths in the EMR may be reported as non-suicide related deaths because the families of the deceased may choose to hide the suicide due to stigma that is associated with such a death in an area where suicide is strictly prohibited by not only religion but also by law.

Among the associated risk factors for suicide ideation, alcohol use and illicit drug use in particular were underreported. There is a need for accurate reporting on substance abuse in the

EMR region in general, as well as increased education on the harmful effects of substance abuse, especially in those countries, such as Lebanon, where adolescents can easily obtain alcohol at stores. Even in those EMR countries where the sale of alcohol is banned, anti-drug and alcohol education is important because adolescents may still obtain illicit drugs or alcohol, especially in countries such as the UAE and Morocco where there is a large influx of imported goods and tourists. Initiatives to increase spending on healthcare in EMR countries would also be beneficial, especially in the area of mental health, which is largely underfunded in many EMR countries. Grassroots organizations that address mental health issues through the designing and implementation of prevention strategies for parents and teachers of adolescents would also be beneficial especially in countries where it is difficult to obtain health care (Morocco only has 0.62 physicians per 1,000 residents).

Current initiatives taken by the WHO include a World Suicide Prevention Day which is also celebrated in the EMR countries. Only six of the 22 member states included in the EMR have ever reported official national suicide rates to the WHO, and the rates that are reported are always extremely low compared to other parts of the world. The current WHO statistics show that there are approximately 36,000 suicide deaths in the EMR annually, but the actual number may be much higher. In an attempt to reach out to those who feel despair and a lack of hope, and to provide a message of hope and understanding to those living in an area where suicidal thoughts may make sufferers feel like societal outcasts, the WHO headquarters in coordination with the Regional Office has established a recording and reporting system on suicide and suicide attempts for use by the EMR countries. Dr. Ala Alwan, the WHO Regional Director for the Eastern Mediterranean states, “This system will provide us with more accurate information, not only about the extent of the problem, but also about the methods used, and those groups that are

particularly vulnerable. It is clear that suicide prevention calls for innovative, comprehensive multisectoral action, including both the health sector and non-health sectors, such as education, labour, the police, the judiciary, religion, law, politics and the media.” Such initiatives can provide invaluable information that in turn can be used to institute and implement appropriately targeted prevention and care programs.

In a region where a significant percent of the population may be living below the poverty line, or the distribution of wealth is far from equally distributed, it is also important to establish programs and initiatives that are cost-effective and timely in their implementation. Organizations such as the WHO provide invaluable resources to many countries across the world, including those of the EMR. The WHO is also supporting the development of a coordinated child and adolescent mental health program that aims to provide low-income countries throughout the world with a multi-step program that aids in prevention of violence, substance abuse and suicide, as well as providing education on mental health issues among children. In addition to the program, the WHO Department of Mental Health and Substance Abuse has recently sponsored a conference on "Caring for Children and Adolescents with Mental Disorders: Setting the WHO Agenda." This meeting brought together experts from the WHO Regions to discuss issues related to diagnosis and treatment of mental health issues. Such open dialogue between countries is crucial in raising awareness and aiding in the creation of programs that will eventually aid reducing suicide rates across the globe.

A few aspects of this study proved to be especially interesting, and would provide good topics for future research. It would be interesting to delve into further research in those countries that did not report any data on illicit drug or alcohol use to see what the reality is in terms of alcohol consumption. Just because the sale and consumption of alcohol or illicit drugs is banned

does not necessarily mean that either substances are never consumed in such countries. Also, gathering data from such countries would prove to a difficult but worthy task, one that has not been previously attempted by researchers.

Secondly, physical fighting was not significantly associated with suicide ideation in three out of the four countries in the study; it was only significantly associated with suicide ideation in the UAE. This differs from almost every other part of the world, including the United States, where adolescent physical fighting is strongly and significantly associated with suicide ideation (Swahn et al, 2008). An interesting topic for future study would be to examine the reasons behind why physical fighting is not as significantly associated with suicide ideation among youth in the EMR as compared to youth in other parts of the world.

Conclusion

There is a need for increased research into the areas of mental health in the EMR, especially in the area of suicide and suicide related behaviors. Suicide related statistics may be underreported in many nations of the EMR which are predominantly Islamic, and suicide is strongly forbidden by religion. Previous studies indicate that suicide ideation is strongly associated with certain risk factors. This study analyzed eight of these risk factors using a secondary logistical regression analysis of data from the Global Student Health Survey which is conducted annually by the WHO. The risk factors included in the study are bullying victimization, alcohol use, illicit drug use, having no friends, feeling sad, missing school, physical fighting and hunger. Additionally, associations were examined among different age groups ranging from 12 to 17 years and among the two genders. Several of the risk factors were shown to have a strong association to suicide ideation. Suicide ideation was more common

among girls than in boys among all the countries studied. The results of this study may be useful to those looking to design and implement educational suicide prevention programs among school-age children in the EMR. The research presented in this study may prove useful in determining which areas of suicide related risk factors are the most important to address when designing programs and interventions for adolescents.

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