Summer 7-23-2018

Distribution of Psychiatric Disorders Among Adolescents of Togo

Kokou Volley

ABSTRACT

Distribution of Psychiatric Disorders Among Adolescents of Togo
By
Kokou Agbele Mawulom Volley

INTRODUCTION: Mental health disorders are a major public health concern, whether it is in developed countries or developing countries. The importance of the mental health disorders is more pronounced when they concern adolescents. Suicide, one of the consequences of mental health disorders, which is among the leading cause of death of adolescents in the world, is the second leading cause of death in the United States (US). In the Western world, many data have been published concerning the phenomenon and actions are being taken to prevent those disorders. Unfortunately, in the developing world, especially in Togo, which is the focus of the current study, data on adolescent mental health disorders are scarce. Knowing the frequency and the nature of mental health disorders within a community is the first step to guiding research, policy, and program implementation.
AIM: Provide data on the distribution of mental health disorders among adolescents of Togo
METHODS: We used a dataset established through the collection of information in the medical records of patients who have consulted in the Department of Psychiatry and Medical Psychology at the teaching hospital of Lome-Campus in Togo. The review covered medical records from January 1, 2004 to December 31, 2013 and included information on 2,190 individuals. Among those individuals, we selected 242 patients who met the inclusion criteria of this study. To be included, a patient must have consulted during the period covered by the study at the department, and the person had to be between 10 to 19-years-old and have a clear diagnosis of a mental health disorder. The variables examined in this study were socio-demographic characteristics and mental health diagnoses according to the definition of ICD-10. We reported the descriptive statistics in form of means with 95% confidence interval, frequencies with Pearson Chi-square or Fisher exact test when needed, with a p-value of 0.05 for significance level. SAS was the statistical software used to compute the statistics.
RESULTS: The mean age of adolescents who developed a mental health disorder was 17.19-years-old with 95% CI of [16.99,17.39]. Females were more concerned by mental health disorders than males (61.16% vs 38.84% of the sample). Most of the adolescents had a low socio-economic status. The mental health disorders were distributed as follow: 35.95% were “Acute and Transient Psychotic Disorders (F23), while 21.90% were “Somatoform Disorders-Other Neurotic Disorders (F45-F48)”, 8.26% were “Depressive Episode- Recurrent Depressive Disorders (F32-F33)”, 6.61% were “Reaction to Severe Stress, and Adjustment Disorders (F43)”, 6.20% were “Dissociative [conversion] Disorders (F44)”, and 04.55% were “Mental and Behavioral Disorders due to Use of Cannabinoids (F12)”.
DISCUSSION: Most of our results were consistent with studies published in the literature.
CONCLUSION: More studies need to be done on a population basis to confirm the trend of mental health disorders in the country of Togo.

DISTRIBUTION OF PSYCHIATRIC DISORDERS AMONG ADOLESCENTS OF TOGO

by

KOKOU AGBELE MAWULOM VOLLEY

MD, FACULTY OF HEALTH SCIENCES-UNIVERSITY OF LOME-TOGO

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

APPROVAL PAGE

DISTRIBUTION OF PSYCHIATRIC DISORDERS AMONG ADOLESCENTS OF TOGO

by

KOKOU AGBELE MAWULOM VOLLEY

Approved:

Dr. Emily Graybill

Committee Chair

Dr. Ike Okosun

Committee Member

Date

07/23/2018

Acknowledgments

I would like to recognize in this thesis, the tremendous work of the Fulbright program which helps many international students like me, coming from developing countries such as Togo, to study in the US. The study opportunity that Fulbright grants me has been a great blessing to me, since through that opportunity, I am able to graduate today as a MPH degree holder. I believe that as I have started already through the study reported in this thesis, my training in public health through the Fulbright scholarship will be beneficial to my country-Togo.

I would like to thank also my professors, especially Dr. Graybill, Dr. Okosun, Dr. Popova, Dr. Ido and all the professors of Georgia State University who have contributed to my training. In addition, I would like to recognize my brothers Jean and Rene, and their wives Esther and Magui. May God bless them tremendously.

Mostly, I would like to thank my Sweet Heart, my Honey, Ablavi Delali Fedenou for all her support, working in a night shift to be able to be with the kids during the day, as I am at school. With her, I thank Kerubim and Yayra, my handsome kids.

Above all, I thank my Lord Jesus-Christ for being with through all my life, and through all this time of training in my MPH program.

Author's Statement Page

In presenting this thesis as a partial fulfillment of the requirements for an advanced degree from Georgia State University, I agree that the Library of the University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote from, to copy from, or to publish this thesis may be granted by the author or, in his/her absence, by the professor under whose direction it was written, or in his/her absence, by the Associate Dean, School of Public Health. Such quoting, copying, or publishing must be solely for scholarly purposes and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without written permission of the author.

KOKOU VOLLEY

Signature of Author

TABLE OF CONTENTS

List of Tables

CHAPTER I

Introduction

Definition of Mental Health and the Definition of Mental Health Disorder

Mental health is defined by the World Health Organization (WHO) as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" ("Mental health: A state of well-being", 2014). Whenever any of the criteria in this definition is not being met in the life of an individual, the individual is probably developing a mental, an emotional, or a behavior disorder. For WHO, mental disorders are "generally characterized by a combination of abnormal thoughts, perceptions, emotions, behavior and relationships with others" (World Health Organization [WHO], 2014). The American Psychiatric Association (APA) has defined mental disorder as "a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental process underlying mental functioning" (American Psychiatric Association [APA], 2013). To estimate the burden of diseases, the World Health Organization uses disability adjusted-life years (DALYs), which is defined as a "health gap measure that extends the concept of potential years of life lost due to premature death to include equivalent years of healthy life lost by virtue of individuals being in states of poor health or disability" (Murray, 1996). According to a study realized in 2010, mental health and substance use disorders were estimated to 28.5% of the global years lost due to disability, and 10.4% of the global disability-adjusted life (Whiteford, Ferrari, Degenhardt, Feigin, & Vos, 2015). Per a study in 2011, mental health disorders accounted for 37% of all non-

communicable diseases in the world (World Economic Forum & Harvard School of Public Health, 2011).

Mental Health Among Adolescents

Adolescents are at high risk for developing a mental health disorder. WHO defines adolescents as the group of individuals between the age of 10 and 19 years old. Almost 50% of all the mental concerns start before the age of fourteen ("Adolescents: Health risks and solutions", n.d.; WHO, 2014). At any given time, 20% of adolescents are experiencing mental health issues (UNICEF, 2012). Research also suggested that mental health disorders contribute to 45% of the total years lost due to disability (YLD) among adolescents (Davidson, Grigorenko, Boivin, Rapa, & Stein, 2015; Gore et al., 2011).

There are several reasons behind the fact that adolescents are at higher risk for mental health concerns. Through research, it is known that adolescence is a period when the brain undergoes many changes. As Laurence Steinberg has explained it, there are four changes that occur in the human brain during adolescence (Steinberg, 2012). The first one is the reduction of the volume of the gray matter in the regions of the prefrontal which causes an important amelioration in the cognitive ability and logical reasoning in adolescence (Steinberg, 2012). The second change is the increase of dopaminergic receptors in the channels that link the limbic system to the prefrontal cortex. The limbic system being the center of emotion, reward and punishment processing center, the increase of the neurotransmitter dopamine in the system explains the increase in the reward-seeking attitude in adolescence. In addition, as dopamine is known to intervene in pleasure experience, these changes explain the sensation-seeking habit of adolescents (Steinberg, 2012). The third change is the augmentation in the volume of the white matter located the prefrontal region. This change is linked to the performance of high level task

such as making a schedule, weighing risks and rewards or making complex decisions (Steinberg, 2012). The fourth change is the strength of the link connecting the prefrontal region and the limbic system of the brain. This allows the adolescent to exercise self-control and to process regulation of emotions (Steinberg, 2012). These changes happen in a context of maturation of the adolescent. Any irregularity in the maturation process, triggered by societal, psychological, biological and environmental factors can cause the adolescent to experience a mental health concern (Casey, Jones, & Hare, 2008; Crone, 2009; Paus, Keshavan, & Giedd, 2008). The additional risk factors, beside the neurological system changes, are described in detail in the literature review below.

Unmet Mental Health Concerns

There are a lot of unmet mental health needs among adolescents. According to the WHO, between 76% and 85% of adolescents who have mental health concerns do not receive any treatment in less-developed countries while that proportion varies from 35% to 50% in developed nations (WHO, 2014). Even though some of the individuals have access to treatments, the treatments are not high-quality according to some findings ("Mental health action plan 2013 – 2020", 2015). There are great disparities between developed and less-developed countries on the amount spent on mental health services. WHO has revealed that the annual mental health disorders services spending per person is US $2 and in less-developed countries it is not more than US $0.25 per person ("Mental health action plan 2013 – 2020", 2015). Another study from the WHO revealed that the mental health needs may be more prevalent in less-developed countries with a smaller mental health workforce, fewer policies guiding services for individuals with mental health concerns, the absence of a civil rights movement in favor of people with

mental health concerns, and less medication availability ("Mental health action plan 2013 – 2020", 2015).

Consequences of Untreated Mental Health Disorders in Adolescence

Failing to address the mental health concerns in general, and specifically of adolescents has societal consequences. Per an estimation made in 2011, the global cost of illness due to mental health issue, both direct cost and indirect cost, is US$ 2.5 trillion and it is projected to be US$ 6 trillion in 2030 (World Economic Forum & Harvard School of Public Health, 2011). In 2007 in the US, the cost of mental health issues among youth was estimated to be US$ 247 billion (O'Connell, National Research Council (U.S.), Boat, & Warner, 2009). This estimation is illustrated by a diagram in the study of O'Connelle (O'Connell, National Research Council (U.S.), Boat, & Warner, 2009). The diagram illustrates how the mental, emotional, and behavioral disorders can affect the individual by causing death or low quality of life, but also how mental health disorders can affect families, victims and peers. The effect on the adolescent experiencing the mental health issue and the impact on their surrounding community has economic implications (O'Connell, National Research Council (U.S.), Boat, & Warner, 2009). The adolescent who experiences death from mental health concerns will not be able to contribute to the productivity of his or her nation. Also, if there is no death but a low quality of life due to disability, that is also translated into burden for the family and the society (Angold et al., 1998). For the society, many adolescents experiencing mental health concerns experience also poor academic achievement, putting a burden on the education system (Kapphahn, Morreale, Rickert, & Walker, 2006). For instance, a study revealed that youth who smoke have .38 times the odds of having the next high degree (Jane, Ryotaro, & Shawna, 2012). Also, many of the adolescents experiencing mental health and behavioral disorders are incarcerated, driving high the

expenditures in the justice department. Others are being taken care in hospital, increasing by that mean expenses of health care (Einfeld, Ellis, & Emerson, 2011; “More than 1.2 million adolescents die every year, nearly all preventable”, n.d.; O'Connell, National Research Council (U.S.), Boat, & Warner, 2009). A study showed that more than 50% of inmates have mental health problems that corresponded to the DSM-IV description of drug dependence or abuse (Dumont, Brockmann, Dickman, Alexander, & Rich, 2012). In a study in Germany, researchers have demonstrated that when patients admitted to hospital had a psychiatric issue in addition to their somatic illness, the hospital cost increased by 40% (Wolff, Heister, Normann, & Kaier, 2018). Beside these consequences, mental health disorders cause adolescents to have trouble in establishing healthy and safe interpersonal relationship, and trouble securing a job (O'Connell, National Research Council (U.S.), Boat, & Warner, 2009). Shorey et al. demonstrated that the substance use disorders were associated positively and significantly with psychological, physical, and sexual intimate partner violence, with a correlation indice of .17 and a p-value of 0.01 (Shorey et al., 2018). Regarding employment, researchers showed in an international study that employment rate among those experiencing schizophrenia was ranging from 16.2% to 22.6% compare to the general population which was ranging from 75% to 80% (Taskila et al., 2014). More dramatic consequence is suicide which, which is among the main causes of death of adolescents in the world in 2015, the second cause of death of young people between 10 to 24-year-old in the US and is 17.4% of all causes of death for that age group (“More than 1.2 million adolescents die every year, nearly all preventable”, n.d.; National Center for Health Statistics, 2017).

Prevalence of Adolescent Mental Health Disorders in the United States

Developed countries like the US have ample data available on mental health issues in general and on adolescents specifically. The US has several national-level datasets on the prevalence of mental health disorders. Datasets come from the Behavioral Risk Factor Surveillance System (BRFSS), the National Health and Nutrition Examination Survey (NHANES), the National Health Interview survey (NHIS), the National Ambulatory Medical Care Survey, the National Hospital Care Survey (NHCS), the National Study of Long-Term Care Providers (NSLTCP), the National Survey of the Diagnosis and Treatment of ADHD and Tourette Syndrome (NS-DATA), the National Violent Death Reporting System (NVDRS), the Pregnancy Risk Assessment Monitoring System (PRAMS), the School Health Policies and Programs Study (SHPPS), the Web-based Injury Statistics Query and Reporting System (WISQARS), the Youth Risk Behavior Surveillance System (YRBSS), and the National Survey of Children's Health (NSCH). All these surveys provide data on mental health disorders in the US, allowing the US to have an understanding of the prevalence of the mental health disorders experienced by children, adolescents, adults and seniors ("Mental Health", 2018). Results of the survey published on the website of the National Institute of Mental Health revealed that in 2016, 1 out of 5 adults experienced a mental health disorder and 21.7% of women and 14.5% of men experienced a mental health disorder that year. Data from this survey suggested that young adults who are between 18 to 25-year-old had higher rates of mental health disorders than adults over 26. Data showed that the lifetime prevalence of mental illness among them is 49.5% (Mental Illness, n.d).

In addition to the national data sets, research on smaller, more targeted samples in the US has been conducted. Studies have examined the difference in prevalence of mental health concerns among Black, White, and Hispanic adolescents (López, 2017). Other studies have

explored the relationship between experiencing trauma at a young age and experiencing mental health concerns during adolescence (Townsend, 2017). These data can guide researchers and the mental health workforce to develop appropriate mental health supports for adolescents with a range of mental health concerns. There are many datasets like these in the published literature in the US that can be used by the workforce to improve the quality of live for adolescents with mental health concerns. This is not to say that the US and the other developed countries have done enough to give access to mental health services to all adolescents with mental health concerns, but they have the credit of building the datasets to provide guidance to researchers, policy makers, and practitioners. Less data on the prevalence of mental health concerns is available in developing countries.

Prevalence of Adolescent Mental Health Disorders in Developing Countries

Developing countries are just beginning to build their datasets on trends in adolescent mental health. Mental health literatures coming from less-developed countries in the world account for only 10% of the published data on mental health in the world, and data from developing countries in regard of adolescents' mental health issues is scarcer (Patel, Flisher, Nikapota, & Malhotra, 2008; Patel, 2007). This can be explained by the fact that many developing countries are struggling with issues like infectious diseases, famine, malnutrition, low availability of mental health workforce, more interest in mortality than morbidity (Patel, Flisher, Nikapota, & Malhotra, 2008). However, some data suggest that mental health issues are not negligible in those developing countries where the available data are often aggregated for young children and adolescents together. For example, in the Bangalore community in India, the prevalence of mental health disorders among 2064 children and adolescents between 0 to 16-year-old coming from urban and rural areas was found to be 12.5%, while among the Kerala

community in the district of Calicut the prevalence of mental health disorders is 9.4% for the 1402 children and adolescents included in the study and who are between 8 to 12-year-old (Hackett, & Hackett, 1999; Patel, Flisher, Nikapota, & Malhotra, 2008; Srinath et al., 2005). In a rural community in Brazil, the prevalence of mental health disorders for 1251 children and adolescent, aged between 7 to 14-year-old is 12.7% (Patel, Flisher, Nikapota, & Malhotra, 2008). These results of low prevalence can be misleading [why are these data misleading? Please explain] and suggest that the prevalence of mental health disorders in general, and of adolescents, is lower in developing countries. Referring to the estimation of the economic burden of diseases on less-developed countries, mental health cost in developing countries in 2010 is a total of US$ 870 billion in both direct and indirect cost and is estimated to reach by 2030 US$ 2,113 billion (World Economic Forum, & Harvard School of Public Health, 2011). The estimation for 2010 is more than the combined national budgets spent in 2016 by all the 54 African nations (US$ 516 billion) (US$ 516 billion) ("List of countries by government budget", 2018). These estimations were done through a method called cost-of-illness (COI). To estimate the cost, economists evaluated the direct cost (cost related to diagnosis, treatment and care), and indirect cost (cost related to lack of productivity and earning due to disability or death) of sicknesses (World Economic Forum, & Harvard School of Public Health, 2011)

Regarding data on treatment, Morris et al. analyzed the treated prevalence of mental health issues and the mental health services that children and adolescents received in 42 low-and-middle-income countries, and they found that only 159 per 100,000 population of children and adolescents experiencing mental health disorders received mental health services compared to 664 per 100,000 adults with mental health concerns (Morris et al., 2011). That is 1 child/adolescent treated out 629 children/adolescents with mental health concerns and 1 adult

treated out of 150 adults with mental health concerns. In a study that examined adolescents with mental health disorders in Mexico revealed that less than one adolescent among seven with a mental health disorder had access to a mental health service during the study period, and among those who used a mental health services, only half received adequate treatment (Borges, Benjet, Medina-Mora, Orozco, & Wang, 2008).

Prevalence of adolescent mental health disorders in Africa

When it comes to Africa, many of the countries have a wide range of public health concerns to address such as HIV outbreak and high rates of malaria. And as a result, there are not the financial nor the personnel resources to address adolescent mental health disorders. Because of this dearth of mental health resources, little data exist on the prevalence of mental health disorders in African countries. Nevertheless, some countries on the continents have some data available. In South-Africa's urban community, the prevalence of mental disorders among youth of 6 to 16-year-old was 15.2% and based on the data from a study conducted in a rural Ethiopian community, the prevalence of mental illness among youth of 5 to 15-year-old was 17.7% (Patel, Flisher, Nikapota, & Malhotra, 2008). These studies have produced data that South-Africa and Ethiopia can use to inform research, policy, and program development. The focus of the current study is on the prevalence of adolescent mental health disorders in Togo.

Prevalence of adolescent mental health disorders in Togo

The published literature on mental health disorders in Togo in minimal. Through a hospital-based study, Soedje and colleagues found that the hospital prevalence of psychiatric disorders, for all age groups, is 05.52% (Messanh Agbémélé, 2015). However, there are no official data from the department of health available on the topic and no official policy known to address mental health issues. Although Togo does have a department of medical psychology and

psychiatry in the teaching hospital of the University of Lome, this department is directed by the only professor of psychiatry in the country. There are also two other psychiatrists in the department. The purpose of this study is to provide the country of Togo with descriptive data on adolescent mental health disorders in their country.

Purpose of the Current Study

This study will describe the distribution of mental, emotional, and behavioral disorders among adolescents ages 11 to 19-years-old who have consulted in the psychiatric department of the teaching hospital of the University of Lome. This is a descriptive study that aims to provide an overview of the distribution of adolescent mental health disorders among adolescents who received care from the Department of Psychiatric and Medical Psychology of the teaching hospital of Lome-Campus in Togo.

CHAPTER II

Literature Review

Adolescents' mental health disorders need to have more attention from researchers and policy makers. However, the knowledge gained about the phenomenon through the existing literature allow us to identify some of the factors that are predictive to the development of the mental health issues among adolescents. The factors that we will present in this literature review are not exhaustive. They are those reported mainly by Nanlesta A. Pilgrim and Robert W. Blum in their article "Adolescent mental and physical health in the English-speaking Caribbean" (Pilgrim & Blum, 2012).

Gender

Gender is identified by multiple studies to be one of the factors that are predictive of adolescents' mental health disorders development. Pilgrim and Blum have found in their article review that females are more likely to present with depression, suicidal ideation, and suicide attempt. One of the articles that reported this was the "Adolescent depression in Trinidad and Tobago" written by Maharajh et al., in which they found that 17.9% of the females in the study have depression while only 8.2% of males experienced it (Maharajh, Ali, & Konings, 2006). In another study conducted in China in 2001 by Unger et al., 12% of boys and 24% of girls from the study reported feeling depressed, while 17% of males and 29% of female said they were feeling hopeless about their future (Unger, 2001). In contrast to these results, some studies showed that sometimes females are more satisfied with their life than their counterpart males. It is the case in a study conducted both in Nepal and in India (Simpson, Schumaker, Dorahy, & Shrestha, 1996). The author of the Nepal study explained that because of the modernization of the society, women are less pressured by tradition, making them more satisfied with their life.

If the previous paragraph shows that females are more likely to be depressed than males, in a study conducted in Nigeria by Adewuya et al., 18% of males are alcoholic while only 6.8% of females were alcoholic (Adewuya, 2006). Another study in Europe conducted by Wartberg et al. showed that the male gender is associated significantly with behaviors that are antisocial, difficulty to control anger, emotional distress, troubles with self-esteem, and hyperactivity or attention deficit (Wartberg et al., 2017). In addition, other studies such as the study of Soyibo and Lee, pointed out the fact males were significantly associated with the use of illicit substances (Soyibo & Lee, 1999). Although it is difficult to point to a specific reason causing this disparity, one suggestion was that because men biologically metabolize substance better than women, women tend to not engage in such behavior ("Gender and Substance Abuse", n.d)

Age

Several studies have reported association between the types of mental and behavioral disorders that adolescents develop and adolescents' age. In a study conducted both in Australia and Denmark, Nielsen et al. compered three adolescents age groups (11-12, 13-14, 15+) regarding emotional symptoms, behavioral disorders and school connectedness. The researchers found that in Denmark, low level of school connectedness, emotional symptoms, and behavioral disorders are more frequent as the ages of the adolescents increased (Nielsen et al., 2017). These results were also supported by Shuli et al. in their study of Bahamian youth. They found that older adolescents were more likely to have depression symptoms than younger adolescents (Shuli et al., 2006). In another study by Halcón et al. looking at the overall health of adolescents in the Caribbean, adolescents older than 12-years-old were more likely to have excessive anger, more likely to commit suicide, more likely to desire to commit a homicide, and were more likely to think that they will not be alive to reach 25-year-old (Halcón et al., 2003). This age difference

may be because as children are becoming more adolescents, they tend to seek experiences, which leads them to some deviant behavior such as drug abuse, exposing them to drug use consequences (Sussman, Skara, & Ames, 2008). Add the WHY of all of these studies.

Ethnicity

Ethnicity is a factor in mental health study that is not common to incriminate as a predictor of a specific mental illness. Many studies have been conducted to evaluate the distribution of mental health disorders across ethnic groups. However, whatever are their results, socio-economic factors can most of the times explain the results found. In a study conducted in New-Zealand, where the authors were looking at the differences in adolescent mental health concerns among Maori tribes and non-Maori tribes, the authors found that Maori adolescents where more likely to develop mental health issues than their counterpart non-Maori adolescents. In another study in Australia, adolescents from Aboriginal tribes are three times more likely to commit suicide compare to the national average (Allen & McKenzie, 2015). The common characteristic of those tribes is that they are socially, and economically disadvantaged. Their socio-economic status may be the factor of their poor mental health instead of their belonging to their tribes. To support this, studies carried among adolescents of Trinidad and Tobago by Ali et al. did not find any significant association between adolescent's mental health and ethnicity Ali & Maharajh, 2005; Maharajh, Ali, & Konings, 2006). A study conducted among adolescents in the US has showed that Hispanics and Non-Hispanic Blacks are more likely to engage in delinquency compare to Non-Hispanic White adolescents (López et al., 2017). Even this study did not show a relation between ethnicity and mental health concerns because the same study reported that Hispanics and Non-Hispanic Blacks are more subject to polyvictimization than their counterpart Whites. This can explain the results of the study.

Family Factors

Going through the literature looking for the factors associated with adolescents' mental health concerns, family factors are consistently present. In a study conducted by Salom et al., the researchers found that there was an association between parent drinking behavior and adolescents' alcohol drinking, smoking and attention/thought problems. The study found that fathers' drinking problems were associated with adolescents' alcohol and mental health issues. In fact, Salom et al. found that the odds ratio of adolescents' drinking when their mothers drink is 1.56, with a 95% confidence interval (CI) of [1.09-2.22], compare to when their mothers do not drink. The same odds ratio is 2.41 with a 95% CI of [1.10-5.29] when it is the adolescents' fathers that do drink. The odds ratio of adolescents developing drinking habit when there is low mother-offspring warmth versus when there is good mother-offspring warmth is 3.19 with 95% CI of [1.99-5.13] (Salom, Williams, Najman, & Alati, 2015).

Another study realized by Poole-Di Salvo et al. has reported the impact of household food insecurity on adolescents' mental health. The study found that mental health issues are more common among adolescent with household food insecurity than adolescents who did not have the household food insecurity issue (28.7% vs 9.2%). Even after the researchers have controlled the results for confounders, the odds ratio comparing adolescents who live in a household with food insecurity and those who do not is 2.3 with a 95% CI of [1.6-3.3] (Poole-Di Salvo, Silver, & Stein, 2016).

In addition to these studies, other studies have reported different sides of family's impact on adolescents' mental health. In the study led by Shuli et al., the saw that depressed youth reported that they had been less monitored by their parents compare to non-depressed youth who reported higher level of monitoring by their parents (Yu et al., 2006). Another study by Liu et al.

found that there is an association between the type of sibling adolescents have and their mental health status. Liu and al. found that adolescents girls with brothers have reported having a good mental health compare to girls who do not have, and as overall results, adolescents who have siblings have a good mental health than those who do not have (Liu et al., 2015). Moreover, a study by Ali et al. have demonstrated the association between adolescent mental health and the family structure. The result revealed that adolescents who were living in reconstituted families were more inclined to have suicidal ideation compare to adolescents living in other types of families. Also, the study found that adolescents living in families that are not dislocated are at a lower risk of developing suicidal ideation (Ali & Maharajh, 2005). These results might be because the family is the primary social environment of the development of the adolescent.

Religion

Another variable related to the mental health status of adolescents is religion. Several studies have found that adolescents who are more religious are less likely to develop mental health disorders. Researchers have studied this relationship with individuals who identify themselves as Christian, Jewish, or Muslim (Koenig, King, & Carson, 2012). In a study conducted among adolescents in Trinidad-Tobago, researchers found that adolescents who attended church service at least seven times during the previous six months were less likely to have had suicidal thoughts compared to those who did not attend any service during that same period of time. In this same study, results suggested a significant reduction of suicidal thoughts and suicidal attempts among adolescents who prayed with their families (Ali & Maharajh, 2005). The study conducted by Maharajh et al. also reported the same results (Maharajh, Ali, & Konings, 2006). Maharajh conducted a study in the same Trinidad-Tobago to learn about depression and the factors that were associated to it among adolescents students and found that

those who were religious had less depression compare to those who were not.Toussaint et al. investigated the impact of religiousness on suicide among adolescents in Trinidad-Tobago. The results showed that adolescents who were Christians (Catholic and Seventh-Day Adventist) were less likely to have suicidal thoughts compared to nonreligious adolescents. The study found also that adolescents who were Hindus were more likely to be treated for suicide attempt or thoughts (Toussaint et al., 2015). Sanders et al. found, in their study about religiousness and mental health among adolescents and young adults attending the Latter-Day Saints in UTAH State, that the participants had low risk to develop depression, anxiety, or obsessive-compulsive disorder. Those adolescents' religiosity was positively associated with a high sense of self-esteem, a high identity integration, a high moral self-approval, and a meaning in life (Sanders et al., 2015). These positive mental health effects of religiosity among Christians might be because of the teaching of the Bible which recommends Christians to no worry about anything (PHILIPPIANS 4:6 KJV, n.d.)

Socio-economic status

Another parameter that is known to influence the mental health of adolescents is the socio-economic status (SES). A study by McLaughlin et al. using the national survey of adolescents of the United States showed that socio-economic status was significantly associated with mental health disorders (Mclaughlin, Costello, Leblanc, Sampson, & Kessler, 2012). This study discovered that when parents were educated, their adolescents were less likely to develop anxiety, and discovered also that when there was a lack in the life of the adolescent compared to his peers, the adolescent was susceptible to develop mood disorders. In another study, Bachman et al. found that parents low socio-economic status was associated with adolescents' substance use (Bachman, O'Malley, Johnston, Schulenberg, & Wallace, 2011).

Sharma et al. in India, through a research involving 600 high school students, found that adolescents coming from a high-income family have a better overall mental health (Sharma & Dua, 2011). Amone-P'Olak et al. found the same result in their study analyzing socio-economic position and adolescents' mental health (Amone-P'Olak et al., 2009). In contrary, other study revealed that adolescents whose parents are professional tend to have drug and alcohol use problems (Soyibo & Lee, 1999). Maybe this last result is due to the fact that the parents were so occupied that they did not have enough time to interact with their adolescents, leading the adolescents to relate more with their peers who had bad habits.

Living environment

The living environment in our present study concerns the place where adolescents are living in. This include community, culture, and geographic location such as cities or rural areas. The impact of community characteristics was investigated in the study "Community Context of Social Resources and Adolescent Mental Health". Wickrama and Bryant found in the study that adolescents living in high poverty neighborhood have mental health issues more frequently than those who do not live in low-income neighborhoods (Wickrama & Chalandra, 2003).

Moreover, other studies revealed that living in rural area has an adverse effect on adolescent's mental health. In a study in Russia, researchers found that adolescents living in non-urban area are two times more likely to develop mental health problems (Slobodskaya & Semenova, 2016). Allen et al. also reported a similar result in their study of adolescent mental health in Australia. They reported that the suicide rate among youth living in rural places is the double of those living in urban eras (Allen & McKenzie, 2015). This might be due to the lack of opportunities to reach a high socio-economic status in rural areas when compared to urban areas.

CHAPTER III

Methods and Procedures

IRB Approval

This study is using a data related to human subject. This qualifies the study to apply for an IRB approval. The IRB approval was accorded for the realization of this study.

Data Source

This dataset for this study comes from the Department of Psychiatry and Medical Psychology of the teaching hospital of Lome-Campus. The data were collected through an initiative of the department to produce a database using medical records of patients that received consultation from psychiatrists in the department from January 1, 2004 to December 31, 2013. The database was produced in 2014 through the collaboration of physicians and interns who were in the department during that year. The department is the only psychiatric unit in Togo; this unit has one professor and two psychiatrists in addition to several psychologists.

Study Design

This study is a retrospective review and a descriptive study using hospital data from January 2004 to December 2013. We use the data gathered to estimate the department-based distribution of mental, behavioral, and emotional disorders among adolescents who received treatment during the study period. We then describe the distribution of those disorders according to socio-demographic characteristics.

Study Population and Sample Size

The database for this study includes patients who consulted in the Department of Psychiatric and Medical Psychology from 2004 to 2013. These patients are Togolese of all age-groups and ethnic-groups. The total number of patients whose medical records are in this

database is 2,190. For this study, we are analyzing the data of the 242 patients between the ages of 11 and 19 years-old who were in the 2,190 patients and who met our study criteria.

Variables of the Study

The psychiatric disorders examined in this study are defined using the International Classification of Disease, tenth revision (ICD-10) ("The ICD-10 classification of mental and behavioral disorders: Diagnostic criteria for research", 2003). In the ICD-10, there are different categories of mental health disorders. Each category is named using the letter F followed by a number indicating the disorder's category, and then by another number, separated from the first by a dot, indicating the exact name of the mental health disorder (e.g., F23.1). Some disorders are classified exclusively for children and adolescents. These are mental health disorder categories F90 to F98. In addition to the adolescent-specific mental health disorders, adolescents may be diagnosed with other conditions listed in the ICD-10 (F0 to F99; See appendix A). In the database we have used, some diagnoses are coupled with others that are in the same broad category of diagnoses. To make it simple, we used the couple as one diagnosis whenever any disorder of the couple was diagnosed. In this study, we will describe proportion of adolescents experiencing mental health disorders in Togo. We will organize the data by the socio-demographic variables listed in Table 1.

Table 1

Variables of the study

Variables	Values
Sex	Female, Male
Marital status	Married, Single
Education	< High school, >College
Religion	Animists, Atheists, Catholics, Protestants, Muslims, Syncretists
Ethnicity/Tribe	Adja-Ewe, Akebou/Akposso, Gun, Kabye/Tem, Mina, Nigerian, Nigerien
Profession	Student/trainee, worker
Region of residency	Lome-commune, Centrale, Kara, Maritime, Plateaux, Savanes
Daily income	< US$ 2, US$ 2-5, >US$ 13
Social interaction	Parents, Family member, Guardian, Alone, Other
Trigger event	None, Academic failure, Relative death, Financial issue, Puerperium, Marital conflict, Unhappy love affair, Money lost, Surgery, Torture
Place coming from	Home, Medical center, Traditional doctor, Church/pastor
Medication availability issues	None, Financial issues, Cultural issue.
Health insurance	No, Yes
Disease duration before consultation	<1 year, ≥1 year

Statistical Analysis

We used the statistical analysis software SAS in its 9.4 version to analyze the data. Because this is a review and a descriptive study, we have performed a descriptive analysis of the variables we considered as independent (i.e., socio-demographic variables) and for the variables that are dependents variables (i.e., mental health disorders) using a Pearson chi-square test to compare categorical variables and reported 95% confidence interval for the continuous variables. We reported the proportion and frequency for the categorical variable and means for continuous variables. After reporting the descriptive statistics of the independent and dependent variables, we proceeded to the descriptive statistics of the distribution of the mental health disorders organized by the independent variables. We used the 95% confidence interval to access the significance of continuous variables results and Pearson chi-square or Fisher exact test for the categorical variables when needed with alpha less than 0.05.

CHAPTER IV

Results

Descriptive Statistics of the Sample

Sample means

The mean age of the studied population was 17.2-year-old with a 95% confidence interval of [17,17.4]. The median age value is 17-year-old and the age mode is 18-year-old (Table 2).

Table 2

Mean age of the sample

Gender specific age	N	Mean	Median	Mode	SD	95% CI
Female	148	17	17	18	1.7	16.7-17.3
Male	94	17.5	18	18	1.4	17.2-17.8
Total sample	242	17.2	17	18	1.6	17-17.4

Gender, marital status, and education

Females represented 61.2% of the sample, compared to males who were 38.8% of the sample. The difference is significant with a p-value less than 0.0005 (Table 3). Regarding marital status, most of the adolescent patients in the sample were single (94.1%) while a minority were married (5.9%). The difference between these two groups was significant with a p-value less than 0.0001 (Table 3). There were 5 missing responses for this variable. Less than 2% of the patients in the sample had college or university degree while the rest of the patients had high school degree or less (Table 3).

Table 3

Socio-Demographic Descriptive Statistics (1)

Variable	Frequency	Percentage	p-values
Age (year)			
11	1	0.4	<0.0001
12	2	0.8	
13	4	1.7	
14	8	3.3	
15	19	7.9	
16	30	12.4	
17	5	24	
18	69	28.5	
19	51	21.1	
Sex			
Female	148	61.2	0.0005
Male	94	38.8	
Marital status*			
Married	14	05.9	<0.0001
Single	223	94.1	
Education**			
< High school	211	98.6	<0.0001
>College	3	1.4	
Religion***			
Animists	2	01.1	<0.0001
Atheists	1	0.5	
Catholics	109	59.2	
Protestants	49	26.6	
Muslims	18	09.8	
Syncretists	5	02.7	
Ethnicity			
Adja-Ewe	129	53.3	<0.0001
Akebou/Akposso	11	04.6	
Gun	10	04.1	
Kabye/Tem	66	27.3	
Mina	24	09.9	
Nigerian	1	0.4	
Nigerien	1	0.4	
Profession			
Student/trainee	137	56.6	0.0397
Worker	105	43.4	
Region of residency			
Lome-commune	229	94.6	<0.0001
Centrale	3	01.2	
Kara	1	0.4	
Maritime	4	01.7	
Plateaux	4	01.7	
Savanes	1	0.4	
Daily income****			
< US$ 2	235	98.7	<0.0001
US$ 2-5	2	0.8	
>US$ 13	1	0.4	

*There are 5 missing responses for this variable; **There are 28 missing responses for the variable; ***There are 58 missing responses for the variable; ****There are 4 missing responses for the variable

Table 4

Socio-Demographic Descriptive Statistics (2)

Variable	Frequency	Percentage	p-values
Social interaction*			
Parents	168	69.7	<0.0001
Family member	58	24.1	
Guardian	13	05.4	
Alone	1	0.4	
Other	1	0.4	
Trigger event**			
None	103	71.	<0.0001
Academic failure	14	09.7	
Relative death	13	09	
Financial issue	5	03.5	
Puerperium	3	02.1	
Marital conflict	2	01.4	
Unhappy love affaire	2	01.4	
Money lost	1	0.7	
Surgery	1	0.7	
Torture	1	0.7	
Place coming from			
Home	182	75.2	<0.0001
Medical center	38	15.7	
Traditional doctor	12	05	
Church/pastor	10	04.1	
Medication availability issues			
None	177	73.1	<0.0001
Financial issues	60	24.8	
Cultural issue	5	02.1	
Health insurance			
No	234	97.9	<0.0001
Yes	5	02.1	
Disease duration before consultation			
<1 year	234	96.7	<0.0001
≥1 year	8	03.3	

*There is 1 response missing for the variable; **There are 97 non-responses for this variable

Religion and ethnicity

According to religious affiliation of the sample, the highest proportion were Catholics (59.2% of the subjects), followed by Protestants and Muslims with 26.6% and 9.8% of the patients respectively. Atheists were the least represented in this sample with a proportion of 0.5% (Table 3). However, for this variable, there were 58 missing responses. More than a half of the subjects were from the Adja-Ewe ethnic group with a proportion of the sample estimated as 53.3%, followed by the groups Kabye-Tem and Mina with proportions of the sample

respectively 27.3% and 9.9%. Small percentages of the sample included patients who identified as Nigerien and Nigerian (Table 3).

Profession, origin region, income, and social interaction

Regarding the vocation of the patients in the sample, 56.6% were students or trainees, while 43.4% were active workers (Table 3). Most of the patients lived in the region of Lome-commune (94.6%). The least represented regions are regions of Kara and Savanes (Table 3). The majority of the patients were lived with less than US$ 2 per day (98.7%). Patients living with more than US$ 13 per day represented 0.4% of the sample (Table 3). Four responses were missing for this variable. Many of the patients in the study lived with their parents (69.7%). Others were lived with a family member (24.1%) or a guardian (5.4%). There is one missing response for this variable (Table 4).

Triggered event and place coming from

For the majority of the subjects (71%), there was not found any trigger event that could explain the experience of the mental health issue. However, we found that 9.7% of the people in the study experienced academic failure and 9% lost a relative before the onset of mental health concerns (Table 4). There were 97 missing response for this variable. In regard of places coming from to the hospital, 75.2% of the subjects came directly from their home, 15.7% came from another medical center, 5% came from a traditional doctor and the remaining came from churches or pastor's house (Table 4).

Medication availability issues and health insurance

The data revealed that 24.8% of the subjects were not able to purchase the medication needed for their treatment because of financial problems, while 2.1% did not purchase the

medication for cultural reasons (Table 4). Nearly 98% of all subjects did not have health insurance while 2% did have. This item has one missing response (Table 4).

Mental health disorders

36% of mental health disorders within the sample were "Acute and Transient Psychotic Disorders (F23), while 21.9% of the disorder of the sample were "Somatoform Disorders- Other Neurotic Disorders (F45-F48)", 8.3% were "Depressive Episode- Recurrent Depressive Disorders (F32-F33)", 6.6% were "Reaction to Severe Stress, and Adjustment Disorders (F43)", 6.2% were "Dissociative [conversion] Disorders (F44)", and 04.6% "Mental and Behavioral Disorders due to Use of Cannabinoids (F12)". The different between these values is significant with a p-value less than 0.0001 (Table 5).

Distribution of the mental health disorders according to the socio-demographics

The most common mental health disorders identified in the sample were Acute and Transient Psychotic Disorders, Somatoform Disorder-Other Neurotic Disorders, Depressive Episode-Recurrent Depressive Disorder, Reaction to Severe and Adjustment Disorders, Dissociative [conversion] Disorders, and Mental and Behavioral Disorders due to use of Cannabinoids. The mean age of onset for Acute and Transient Psychotic Disorders was 17.4-year-old 95% confidence interval (CI) [17.1-17.7]. The mean age of onset of Somatoform Disorder-Other Neurotic Disorders was 17.2-year-old with a 95% CI of [16.9-17.6], while the mean age of onset of Depressive Episode-Recurrent Depressive Disorder was 17-year-old with a 95% CI of [16.2-17.7]. For Reaction to Severe and Adjustment Disorders, the mean age of onset was 16.8-year-old with a CI of [15.7-17.9], and for Mental and Behavioral Disorders due to use of Cannabinoids, the mean age of onset was 17.6-year-old with a CI of [17-18.3]. Tables 6 and 7 show these statistics.

Table 5

Distribution of Mental Health Disorders

Variable	Frequency	Percentage	p-values
F23 Acute and Transient Psychotic Disorders	87	36	<0.0001
F45-F48 Somatoform Disorder-Other Neurotic Disorders	53	21.9	
F32-F33 Depressive Episode-Recurrent Depressive Disorder	20	08.3	
F43 Reaction to Severe Stress, and Adjustment Disorders	16	06.6	
F44 Dissociative [conversion] Disorders	15	06.2	
F12 Mental and Behavioral Disorders due to Use of Cannabinoids	11	04.6	
F19 Mental and Behavioral Disorders due to Multiple Drug Use and Use of Other Psychoactive Substances	4	01.7	
F40-F41 Phobic Anxiety Disorders-Other Anxiety Disorders	4	01.7	
F53 Mental and Behavioral Disorders Associated with the Puerperium not Elsewhere Classified	4	01.7	
F06-F07-F09 Other Mental Disorders due to Brain Damage and Dysfunction and to Physical Disease-Personality and Behavioral Disorders due to Brain Disease, Damage and Dysfunction-Unspecified Organic or Symptomatic Mental Disorder	3	01.2	
F10 Mental and Behavioral Disorders due to Use of Alcohol	3	01.2	
F30 Manic Episode	3	01.2	
F90-F98 Behavioral and Emotional Disorders with Onset Usually Occurring in Childhood and Adolescence	3	01.2	
F21 Schizotypal Disorder	2	0.8	
F55 Abuse of Non-Dependence Producing Substances	2	0.8	
F15 Mental and Behavioral Disorders due to Use of Other Stimulants, Including Caffeine	1	0.4	
F20 Schizophrenia	1	0.4	
F22 Persistent Delusional Disorder	1	0.4	
F24 Induced Delusional Disorders	1	0.4	
F25 Schizoaffective Disorders	1	0.4	
F31 Bipolar Affective Disorders	1	0.4	
F34 Persistent Mood [affective] Disorders	1	0.4	
F42 Obsessive-Compulsive Disorder	1	0.4	
F50 Eating Disorders	1	0.4	
F52 Sexual Dysfunction not Caused by Organic Disorders or Disease	1	0.4	
F60-F61 Specific Personality Disorders-Mixed and Personality Disorders	1	0.4	
F70-F79 Mental Retardation	1	0.4	

Table 6

Distribution of Mental Health Disorders by Age (1)

Variable	F23 Acute and Transient Psychotic Disorders				F45-F48 Somatoform Disorder-Other Neurotic Disorders				F32-F33 Depressive Episode-Recurrent Depressive Disorder			
	N	M	Mean	CI	N	M	Mean	CI	N	M	Mean	CI
age	84	18	17.4	17.1-17.7	53	17	17.2	16.9-17.6	20	17	17	16.2-17.7

N: frequency; Cl: confidence interval; M: median

Table 7

Distribution of Mental Health Disorders by Age (2)

Variable	F43 Reaction to severe stress, and adjustment disorders				F44 Dissociative [conversion] disorders				F12 Mental and behavioral disorders due to use of cannabinoids			
	N	M	Mean	CI	N	M	Mean	CI	N	M	Mean	CI
age	16	17.5	16.8	15.7 -17.9	15	17	16.9	15.9 -18	11	18	17.6	17 -18.3

N: frequency; Cl: confidence interval; M: median

The distribution of mental health disorders by socio-demographic variable (Table 8) suggested that there was a statistically significance interaction between mental health diagnosis and gender. The study revealed that males are more likely to develop Acute and Transient Psychotic Disorders (F23) and Mental and Behavioral Disorders Due to Use of Cannabinoids (F12) than female. Females where more likely to develop Somatoform Disorder-Other Neurotic Disorders (F45-F48), Depressive Episode-Recurrent Depressive Disorder (F32-F33), Reaction to Severe Stress, and Adjustment Disorders (F43), and Dissociative [conversion] Disorders (F44) than males. In general, the mental health distribution across the socio-demographic variables was not different when we compared the diseases categories one to another. However, there was a trend that was observed across all categories of disorders. For instance, we saw that across all mental health disorders, when we considered marriage status, singles outnumbered married.

Table 8

Distribution of Mental Health Disorders by Socio-Demographic Variables

Variables	F23 Acute and Transient Psychotic Disorders		F45-F48 Somatoform Disorder-Other Neurotic Disorders		F32-F33 Depressive Episode-Recurrent Depressive Disorder		F43 Reaction to Severe Stress, and Adjustment Disorders		F44 Dissociative [conversion] Disorders		F12 Mental and Behavioral Disorders due to Use of Cannabinoids		
	N	%	N	%	N	%	N	%	N	%	N	%	p-value
Sex													
Female	39	46.4	43	81.1	15	75	13	81.3	13	86.7	0	0	<0.0001
Male	45	53.6	10	18.9	5	25	3	18.8	2	13.3	11	100	
Marital status*													
Married	6	7.6	1	1.9	2	10.5	0	0	0	0	0	0	<0.4400
Single	76	92.7	52	98.1	17	89.5	15	100	15	100	11	100	
Education**													
< High school	71	98.6	49	100	16	100	14	93.3	14	100	11	100	<0.4599
>College	1	1.4	0	0	0	0	1	06.7	0	0	0	0	
Religion***													
Animists	2	03.4	0	0	0	0	0	0	0	0	0	0	0.0725
Atheists	1	01.7	0	0	0	0	0	0	0	0	0	0	
Catholics	34	57.6	35	74.5	7	43.8	6	60	6	54.6	6	54.6	
Protestants	19	32.2	10	21.3	6	37.5	4	40	1	9.1	2	18.2	
Muslims	3	05.1	2	4.3	3	18.8	0	0	2	18.9	3	27.3	
Syncretists	0	0	0	0	0	0	0	0	2	18.9	0	0	
Ethnicity													
Adja-Ewe	47	56	24	45.3	13	65	7	43.8	8	53.3	6	54.6	0.0017
Akebou/Akposso	6	07.1	1	01.9	2	10	0	0	0	0	0	0	
Gun	4	04.8	0	0	1	5	4	25	0	0	0	0	
Kabye/Tem	16	19.1	21	39.6	4	20	5	31.3	6	40	4	36.4	
Mina	11	13.1	6	11.3	0	0	0	0	1	06.7	0	0	
Nigerian	0	0	0	0	0	0	0	0	0	0	1	09.1	
Nigerien	0	0	1	2	0	0	0	0	0	0	0	0	
Profession													
Student/ trainee	45	53.6	33	62.3	7	35	13	81.3	12	80	7	63.6	0.0342
Worker	39	46.4	20	37.7	13	65	3	8.8	3	20	4	36.4	
Region of residency													
Lome-commune	81	96.4	50	94.3	18	90	14	87.5	15	100	11	100	0.3669
Centrale	1	01.2	0	0	0	0	1	06.3	0	0	0	0	
Kara	0	0	1	02	0	0	0	0	0	0	0	0	
Maritime	0	0	1	02	1	05	1	06.3	0	0	0	0	
Plateaux	2	02.4	0	0	1	05	0	0	0	0	0	0	
Savanes	0	0	1	01.2	0	0	0	0	0	0	0	0	
Daily income****													
< US$ 2	83	98.8	53	100	19	95	15	100	14	100	10	90.9	0.1719
US$ 2-5	1	01.2	0	0	0	0	0	0	0	0	1	09.1	
>US$ 13	0	0	0	0	1	05	0	0	0	0	0	0	

*There are 5 missing responses for this variable; **There are 28 missing responses for the variable; ***There are 58 missing responses for the variable; ****There are 4 missing responses for the variable

CHAPTER V

Discussion

Age

To our knowledge, this is the first study examining the distribution of adolescent mental health disorders in Togo. The mean age for adolescents of the study who had mental health issues was 17.2-year-old with a 95% CI of [17-17.4], and when we consider the specific mean age of girls and boys, the difference between their' means age was not significant. This means that all adolescents of the sample developed mental health issues at approximately the same age. This is not different from the results of Merikangas et al. who have studied the lifetime prevalence of mental health issues among adolescents in the US and found that those who are 17-18-year-old are more likely to develop mental health issues compare to other adolescents age groups (Merikangas et al., 2010).

Gender

The distribution of the sample according gender revealed that difference in number of males and females with mental health disorders was statistically significant. This finding is consistent with what Van Droogenbroeck et al. have found in their study of adolescents in Belgium (Van Droogenbroeck, Spruyt, & Keppens, 2018). However, Merikangas et al. did not find a significant difference between girls and boys in terms of mental health issues development among adolescents of the US (Merikangas et al., 2010). This similarity of results can between the US study and our study can be explained by the fact Togo, alike most African countries, has been shifting from a traditional society to a westernized society, making adolescents of Togo to develop social characteristics of their peers of the US.

Socio-Economic Status

In the study, we found that most adolescents going through mental health issues have a high school education level or less. Also, in our study, many adolescents were living under the poverty limit which is living under US$ 2 per day (Fantom, & Serajuddin, n.d). Level of income associated with level of academic achievement being known as socio-economic status (Perkins, 2016), our study revealed that most adolescents experiencing mental health disorders were from low socio-economic status. This result is confirmed by other studies results. Reiss et al. have found in their study of socio-economic inequality that adolescents who were from low socio-economic status were three times more likely to develop mental health concerns than those who were from high socio-economic status (Reiss, 2013). Klasen et al. found the same results in their study (Klasen et al., 2015). Considering that Togo is a developing country in which many live under the level of poverty, the results of our study is not surprising (Fantom, & Serajuddin, n.d).

Religion

Our results regarding mental health repartition according to religion showed that Catholic adolescents, followed by Protestants and Muslim, are the mostly subject to mental health than Syncretists, Animists and Atheists. This result contrasts with what is in the literature. In a study conducted in 2015 in the US among adolescents, religiosity and mental health issues have been assessed and the results revealed that non-religious adolescents were more likely to develop mental health issues than religious adolescents (Kugelmass & Garcia, 2015). Maybe the results of our study can be explained by the fact that our Togolese society is still attached to traditional culture. Also, we can affirm that our results on the religious distribution of mental health disorders is accurate. More studies need to be done on a population base to have a sense of the reality.

Mental Health Disorders

Considering the mains psychiatric disorders of our study, we found that Acute and Transient Psychotic Disorders was the most frequently occurring mental health disorder, followed by Somatoform Disorders, Depressive Disorders, Reaction to Severe Stress and Adjustment Disorders, Dissociative [conversion] Disorder, and by Mental and Behavioral Disorders due to Cannabinoids. This result is different from what Benjet et al. found in their study which (Benjet et al., 2016). Benjet et al. have conducted a follow-up study of Mexican adolescents on a period of eight years to identify the incidence of mental health disorders. To assess the mental health disorder diagnosis, they used WHO Composite International Diagnostic Interview 3.0 (CIDI), a tool which generates diagnostics according to DSM-IV criteria. The researchers found that Substance Use Disorders category was the main mental health concern, Mood and Disruptive Behavior Disorders category was the second, Anxiety Disorders the third, and Eating Disorders the fourth. The difference of result between our study and the study of Benjet might be due to difference in culture and social factors like proliferation of addictive substances

When we consider the mains disorders of our study, the results revealed that the mean age on which adolescent have consulted for Acute and Transient Psychotic Disorders was 17.4-year-old. This result is not quite different from the results of Gillberg et al. who found that the age on which more adolescents have an onset of psychotic disorder is 18-year-old (Gillberg, Wahlström, Forsman, Hellgren, & Gillberg, 1986). The sex-ratio of the acute and transient psychotic disorders from the study of Gillberg, which is 1.2 boys/1 girl was also like the one in our study which was 1.15 boys/1 girl. More research need to be done to confirm this results that we had in our study.

The mean age for developing Somatoform Disorders and Other Neurotic Disorders was 17.2-year-old with a CI of [16.9-17.6]. Essau et al. found similar results (Essau, Conradt, & Petermann, 1999). They found that among girls and boys, the age group of 16-17-year-old is the most exposed to the development of this category of mental health disorders. In the same study, the researchers found that girls were significantly more likely to develop this pathology than boys. Our study found the same result with a sex-ratio girls/boy of 4.3:1.

The third main mental disorders were the category of Depressive Disorders. The mean age to develop a depressive symptom was 17-year-old. Basu et al. in a study realized in 2017 West Bengal had a similar result because in their study, depression was more common among adolescents who were in the age group of 16-17-year-old (Basu & Biswas, 2017). Our finding is not also different from what Snadal et al. finding which was that adolescents who were 18-year-old had the highest pic of depression symptoms (Sandal et al., 2017). Regarding the distribution of depressive disorders according to gender, we found in our study that girls were more likely to develop depression than boys. This difference is statistically significant. Other studies found the same result in their study (Ellen Li, DiGiuseppe, & Froh, 2006; Salk, Petersen, Abramson, & Hyde, 2016; Sandal et al., 2017). To confirm the trend of the results we found in our study, more research need to be done

Reaction to Severe Stress and Adjustment Disorders Development mean age was 17.5-year-old with a CI of [15.7-17.9]. Gradus et al. in a population-based study found that the pick of diagnostic of Reaction to Severe Stress and Adjustment Disorders is between 15-19-year-old. This is consistent with our mean age (Gradus et al., 2014). In addition, Gradus found that females were more concerned than males in the development of this mental health concern. Our study found the same result.

Dissociative [conversion] Disorders' development mean age was 16.9-year-old with a CI of [15.9-18]. The distribution according to gender showed that girls were more inclined to develop this mental health issue. Svedin et al. found a similar result in their study (Svedin, Nilsson, & Lindell, 2004).

Being the only mental health category in which boys were the only gender susceptible of developing the disorder, Mental and Behavioral Disorders due to Use of Cannabinoids mean age of development was 17.6 with a CI of [17-18.3]. These results are supported by a study of Perou et al. in the US who found that adolescents aged between 12-17-year-old are at higher risk behavioral disorders (Perou et al., 2013). Also, the study found that boys were more likely to experience behavioral disorders. These results of our study need to be confirmed by other studies at the population level.

Limitations and Future Directions

The main limitation of this study was that our sample was not representative of the population of adolescents between 10 to 19-years-old in Togo, causing results to not be generalizable. Also, since we did not have a control group, we could not compute a logistic regression to know the odds of developing a mental health issue among Togolese.

This study gives a hospital-based overview of adolescent's mental health issues in Togo. It is the first of its kind. The results from the study can motivate researchers, in the domain of psychiatry in Togo, to conduct and publish more studies about the topic. The publications will help assess the risk of mental health disorders in the adolescent population. Once the literature on the topic becomes abundant, the risk assessment will be done, and risk management measures can be developed to address the threat that mental health disorders represent for adolescents of today who will become adults of tomorrow (Dearfield, Hoelzer, & Kause, 2014).

Conclusion

This current study has allowed us to collect data on the distribution of psychiatric disorders among adolescents of Togo. From the study, we found that older adolescents are more susceptible to develop a mental health disorders than younger adolescents. We also found that girls are more likely to develop mental health concerns more than boy. Most importantly, we found that mental health issues were associated with low socio-economic status. The health system authorities should address the issue of poverty in general by improving the quality of life of the population. Also, to address the issue of mental health disorders among adolescents and the whole population, health system authorities may adhere to WHO plan to address the issue worldwide ("Mental health action plan 2013 – 2020", 2015). WHO has drafted a plan to improve mental health of the world population, especially of the population from developing counties such as Togo. The organization identified four objectives to achieve in the "Comprehensive mental health action plan 2013-2020". The first is to strengthen effective leadership and governance for mental health; the second is to provide comprehensive, integrated and responsive mental health and social care services in community-based settings; the third is to implement strategies for promotion and prevention in mental health; and the fourth is to strengthen information systems, evidence and research for mental health. By implementing the WHO plan, Togo will find an improvement of the mental health status of its young population.

References

Adewuya, A. O. (2006). Prevalence of major depressive disorder in Nigerian college students with alcohol-related problems. *General Hospital Psychiatry*, *28*169-173. doi: 10.1016/j.genhosppsych.2005.09.002

Adolescents: Health risks and solutions. (n.d.). Retrieved from http://www.who.int/en/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions

Ali, A., & Maharajh, H. D. (2005). Social predictors of suicidal behaviour in adolescents in Trinidad and Tobago. *Social Psychiatry & Psychiatric Epidemiology*, *40*(3), 186. doi:10.1007/s00127-005-0846-9

Allen, K. A., & McKenzie, V. L. (2015). Adolescent Mental Health in an Australian Context and Future Interventions. *International Journal Of Mental Health*, *44*(1/2), 80. doi:10.1080/00207411.2015.1009780

American Psychiatric Association: Diagnostic and Statistical Manuel of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013

Amone-P'Olak, K., Burger, H., Ormel, J., Huisman, M., Verhulst, F. C., & Oldehinkel, A. J. (2009). Socioeconomic position and mental health problems in pre- and early-adolescents. *Social Psychiatry & Psychiatric Epidemiology*, *44*(3), 231-238

Angold, A., Messer, S. C., Stangl, D., Farmer, E. Z., Costello, E. J., & Burns, B. J. (1998). Perceived parental burden and service use for child and adolescent psychiatric disorders. *American Journal Of Public Health*, *88*(1), 75-80.

Bachman, J. G O'Malley, P. M Johnston, L. D Schulenberg, J. E, & Wallace, J. M., Jr. (2011). Racial/ethnic differences in the relationship between parental education and substance use among U. S. 8th-, 10th-, and 12th-grade students: Findings from the J Youth Adolescence

(2018) 47:334–348 345 monitoring the future project. Journal of Studies on Alcohol and Drugs, 72, 279–285. https://doi.org/10.15288/jsad.2011.72.279.

Basu, G., & Biswas, S. (2017). Mental health and depression among school going adolescents: excerpts from a school-based study of Nadia district, West Bengal. *Asian Journal Of Medical Sciences*, *8*(5), 64-69. doi:10.3126/ajms. v8i5.17499

Benjet, C., Borges, G., Méndez, E., Albor, Y., Casanova, L., Orozco, R., & ... Medina-Mora, M. (2016). Eight-year incidence of psychiatric disorders and service use from adolescence to early adulthood: longitudinal follow-up of the Mexican Adolescent Mental Health Survey. *European Child & Adolescent Psychiatry*, *25*(2), 163-173. doi:10.1007/s00787-015-0721-5

Borges, G., Benjet, C., Medina-Mora, M., Orozco, R., & Wang, P. (2008). Treatment of mental disorders for adolescents in Mexico City. *Bulletin Of The World Health Organization*, *86*(10), 757-764.

Casazza, A. (2015, October 16). How are all countries, rich and poor, to define poverty? Retrieved from http://www.undp.org/content/undp/en/home/blog/2015/10/16/How-are-all-countries-rich-and-poor-to-define-poverty-.html

Casey, B. J., Jones, R. M., & Hare, T. A. (2008). The Adolescent Brain. *Annals Of The New York Academy Of Sciences*, *1124*111. doi:10.1196/annals.1440.010

Crone, E. A. (2009). Executive functions in adolescence: inferences from brain and behavior. *Developmental Science*, *12*(6), 825-830. doi:10.1111/j.1467-7687.2009. 00918.x

Davidson, L. L., Grigorenko, E. L., Boivin, M. J., Rapa, E., & Stein, A. (2015). A focus on adolescence to reduce neurological, mental health and substance-use disability. *Nature*, *527*(s7578), S161. doi:10.1038/nature16030

DEARFIELD, K. L., HOELZER, K., & KAUSE, J. R. (2014). Review of Various Approaches for Assessing Public Health Risks in Regulatory Decision Making: Choosing the Right Approach for the Problem. Journal Of Food Protection, 77(8), 1428-1440. doi: 10.4315/0362-028X.JFP-14-046

Dumont, D. M., Brockmann, B., Dickman, S., Alexander, N., & Rich, J. D. (2012). Public Health and the Epidemic of Incarceration. Annual Review Of Public Health, 33325. doi:10.1146/annurev-publhealth-031811-124614

Ellen Li, C., DiGiuseppe, R., & Froh, J. (2006). THE ROLES OF SEX, GENDER, AND COPING IN ADOLESCENT DEPRESSION. *Adolescence, 41*(163), 409-415.

Einfeld, S. L., Ellis, L. A., & Emerson, E. (2011). Comorbidity of intellectual disability and mental disorder in children and adolescents: A systematic review. Journal Of Intellectual & Developmental Disability, 36(2), 137-143.

Essau, C., Conradt, J., & Petermann, F. (1999). Prevalence, comorbidity and psychosocial impairment of somatoform disorders in adolescents. *Psychology, Health & Medicine, 4*(2), 169-180.

Fantom, N., & Serajuddin, U. (n.d.). The World Bank's Classification of Countries by Income. Retrieved January 2016, from http://documents.worldbank.org/curated/en/408581467988942234/pdf/WPS7528.pdf

Gradus, J. L., Bozi, I., Antonsen, S., Svensson, E., Lash, T. L., Resick, P. A., & Hansen, J. G. (2014). Severe Stress and Adjustment Disorder Diagnoses in the Population of Denmark. *Journal Of Traumatic Stress, 27*(3), 370. doi:10.1002/jts.21926

Gender and Substance Abuse. (n.d.). Retrieved from http://alcoholrehab.com/drug-addiction/gender-and-substance-abuse/

Gillberg, C., Wahlström, J., Forsman, A., Hellgren, L., & Gillberg, I. C. (1986). TEENAGE PSYCHOSES-EPIDEMIOLOGY, CLASSIFICATION AND REDUCED OPTIMALITY IN THE PRE-, PERI-AND NEONATAL PERIODS. *Journal Of Child Psychology & Psychiatry*, *27*(1), 87. doi:10.1111/j.1469-7610. 1986.tb00624.x

Gore, F. M., Bloem, P. J., Patton, G. C., Ferguson, J., Joseph, V., Coffey, C., & ... Mathers, C. D. (2011). Articles: Global burden of disease in young people aged 10–24 years: a systematic analysis. *The Lancet*, *377*2093-2102. doi:10.1016/S0140-6736(11)60512-6

Hackett, R., & Hackett, L. (1999). The Prevalence and Associations of Psychiatric Disorder in Children in Kerala, South India. *Journal Of Child Psychology & Psychiatry & Allied Disciplines*, *40*(5), 801.

Halcón, L., Blum, R., Beuhring, T., Pate, E., Campbell-Forrester, S., & Venema, A. (2003). Adolescent health. Adolescent health in the Caribbean: a regional portrait. *American Journal Of Public Health*, *93*(11), 1851-1857. doi:10.2105/AJPH.93.11.1851

Hodgkinson, S., Beers, L., Southammakosane, C., & Lewin, A. (2014). Addressing the mental health needs of pregnant and parenting adolescents. *Pediatrics*, *133*(1), 114-122. doi:10.1542/peds.2013-0927

Jane D., M., Ryotaro, U., & Shawna, R. (2012). Adolescent Mental Health, Behavior Problems, and Academic Achievement. *Journal Of Health And Social Behavior*, (4), 482.

Kapphahn, C. J., Morreale, M. C., Rickert, V. I., & Walker, L. R. (2006). Financing mental health services for adolescents: a position paper of the Society for Adolescent Medicine. *The Journal Of Adolescent Health: Official Publication Of The Society For Adolescent Medicine*, *39*(3), 456-458.

K. A. S. Wickrama, a., & Chalandra M. Bryant, a. (2003). Community Context of Social Resources and Adolescent Mental Health. *Journal Of Marriage And Family*, (4), 850.

Klasen, F., Otto, C., Kriston, L., Patalay, P., Schlack, R., & Ravens-Sieberer, U. (2015). Risk and protective factors for the development of depressive symptoms in children and adolescents: results of the longitudinal BELLA study. *European Child & Adolescent Psychiatry*, *24*(6), 695. doi:10.1007/s00787-014-0637-5

Koenig, H. G., King, D. E., & Carson, V. B. (2012). *Handbook of religion and health*. New York: Oxford University Press.

Kugelmass, H., & Garcia, A. (2015). Mental disorder among nonreligious adolescents. *Mental Health, Religion & Culture*, *18*(5), 368-379. doi:10.1080/13674676.2015.1063044

List of countries by government budget. (2018, June 05). Retrieved from https://en.wikipedia.org/wiki/List_of_countries_by_government_budget

Liu, J., Sekine, M., Tatsuse, T., Fujimura, Y., Hamanishi, S., & Zheng, X. (2015). Association among number, order and type of siblings and adolescent mental health at age 12. *Pediatrics International*, *57*(5), 849-855. doi:10.1111/ped.12629

López, C. M., Andrews, A. I., Chisolm, A. M., de Arellano, M. A., Saunders, B., & Kilpatrick, D. G. (2017). Racial/ethnic differences in trauma exposure and mental health disorders in adolescents. *Cultural Diversity And Ethnic Minority Psychology*, *23*(3), 382-387. doi:10.1037/cdp0000126

Maharajh, H. D., Ali, A., & Konings, M. (2006). Adolescent depression in Trinidad and Tobago. *European Child & Adolescent Psychiatry*, *15*(1), 30-37. doi:10.1007/s00787-006-0501-3

Mclaughlin, K. k., Costello, E. J., Leblanc, W., Sampson, N. A., & Kessler, R. C. (2012). Socioeconomic Status and Adolescent Mental Disorders. *American Journal Of Public Health*, *102*(9), 1742-1750. doi:10.2105/AJPH.2011.300477

Mental health action plan 2013 - 2020. (2015, September 17). Retrieved from http://www.who.int/mental_health/publications/action_plan/en/

Mental health: A state of well-being. (2014, August 15). Retrieved from http://www.who.int/features/factfiles/mental_health/en/

Mental Health. (2018, January 26). Retrieved from https://www.cdc.gov/mentalhealth/data_publications/index.htm

Mental Illness. (n.d.). Retrieved from https://www.nimh.nih.gov/health/statistics/mental-illness.shtml

Merikangas, K. R., Jian-ping, H., Burstein, M., Swanson, S. A., Avenevoli, S., Lihong, C., & ... Swendsen, J. (2010). Lifetime Prevalence of Mental Disorders in U.S. Adolescents: Results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). *Journal Of The American Academy Of Child & Adolescent Psychiatry*, *49*(10), 980-989.

Messanh Agbémélé, S. K., Guy Gérard, A., Toyi, T., Akomola, S. K., Abago, B., Anselme, D., & Simliwa, D. K. (2015). DISPOSITIF DE SOINS ET ASPECTS THERAPEUTIQUES DE PRISE EN CHARGE DES URGENCES PSYCHIATRIQUES AU CHU CAMPUS (LOME). *Mali Médical*, *30*(4), 46-50.

More than 1.2 million adolescents die every year, nearly all preventable. (n.d.). Retrieved from http://www.who.int/news-room/detail/16-05-2017-more-than-1-2-million-adolescents-die-every-year-nearly-all-preventable

Morris, J., Belfer, M., Daniels, A., Flisher, A., Villé, L., Lora, A., & Saxena, S. (2011). Treated prevalence of and mental health services received by children and adolescents in 42 low-and-middle-income countries. *Journal Of Child Psychology & Psychiatry, 52*(12), 1239-1246.

Murray, C. J. L. 1996. "Rethinking DALYs." In The Global Burden of Disease, ed.C.J.L.Murray and A.D.Lopez,1–89.Cambridge,MA:Harvard University Press.

National Center for Health Statistics. (2017, March 17). Retrieved from https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

Nielsen, L., Shaw, T., Meilstrup, C., Koushede, V., Bendtsen, P., Rasmussen, M., & ... Cross, D. (2017). School transition and mental health among adolescents: A comparative study of school systems in Denmark and Australia. *International Journal Of Educational Research*, *83*65-74. doi:10.1016/j.ijer.2017.01.011

O'Connell, M. E., National Research Council, (U.S.), Boat, T. F., & Warner, K. E. (2009). *Preventing Mental, Emotional, and Behavioral Disorders Among Young People : Progress and Possibilities*. Washington, D.C.: National Academies Press.

Patel, V. (2007, April). Closing the 10/90 divide in global mental health research. *Acta Psychiatrica Scandinavica*. pp. 257-259. doi:10.1111/j.1600-0447.2007.01012.x.

Patel, V., Flisher, A. J., Nikapota, A., & Malhotra, S. (2008). Promoting child and adolescent mental health in low and middle income countries. *Journal Of Child Psychology & Psychiatry*, *49*(3), 313-334.

Paus, T., Keshavan, M., & Giedd, J. N. (2008). Why do many psychiatric disorders emerge during adolescence?. *Nature Reviews. Neuroscience, 9*(12), 947-957. doi:10.1038/nrn2513

Perkins, G. (2016). *Socioeconomic Status : Influences, Disparities and Current Issues*. Hauppauge, New York: Nova Science Publishers, Inc.

Perou, R., Bitsko, R. H., Blumberg, S. J., Pastor, P., Ghandour, R. M., Gfroerer, J. C., & ... Huang, L. N. (2013). Mental Health Surveillance Among Children -- United States, 2005-2011. *MMWR: Morbidity & Mortality Weekly Report*, *62*1-35

PHILIPPIANS 4:6 KJV Be careful for nothing; but in every thing by prayer and supplication with thanksgiving let your requests... (n.d.). Retrieved from https://www.kingjamesbibleonline.org/Philippians-4-6/

Pilgrim, N. A., & Blum, R. W. (2012). Adolescent mental and physical health in the English-speaking Caribbean. Revista Panamericana De Salud Pública/Pan American Journal Of Public Health, 32(1), 62-69.

Poole-Di Salvo, E., Silver, E. J., & Stein, R. E. (2016). Maternal and Adolescent Mental Health: Household Food Insecurity and Mental Health Problems Among Adolescents: What Do Parents Report?. *Academic Pediatrics*, *16*90-96. doi: 10.1016/j.acap.2015.08.005

Reiss, F. (2013). Review: Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. *Social Science & Medicine*, *90*24-31. doi:10.1016/j.socscimed.2013.04.026

Salk, R. H., Petersen, J. L., Abramson, L. Y., & Hyde, J. S. (2016). The contemporary face of gender differences and similarities in depression throughout adolescence: Development and chronicity. *Journal Of Affective Disorders*, *205*28-35. doi:10.1016/j.jad.2016.03.071

Salom, C. L., Williams, G. M., Najman, J. M., & Alati, R. (2015). Familial factors associated with development of alcohol and mental health comorbidity. *Addiction*, *110*(2), 248-257. doi:10.1111/add.12722

Sandal, R. K., Goel, N. K., Sharma, M. K., Bakshi, R. K., Singh, N., & Kumar, D. (2017). Prevalence of Depression, Anxiety and Stress among school going adolescent in

Chandigarh. *Journal Of Family Medicine & Primary Care*, *6*(2), 405. doi:10.4103/2249-4863.219988

Sanders, P., Allen, G., Fischer, L., Richards, P., Morgan, D., & Potts, R. (2015). Intrinsic Religiousness and Spirituality as Predictors of Mental Health and Positive Psychological Functioning in Latter-Day Saint Adolescents and Young Adults. *Journal Of Religion & Health*, *54*(3), 871. doi:10.1007/s10943-015-0043-4

Sharma, N., & Dua, R. (2011). Gender & Economic Status Matter in Mental Health of Adolescents? *Journal On Educational Psychology*, *4*(3), 45-50.

Shorey, R. C., Haynes, E., Brem, M., Florimbio, A. R., Grigorian, H., & Stuart, G. L. (2018). Marijuana use is associated with intimate partner violence perpetration among men arrested for domestic violence. *Translational Issues In Psychological Science*, *4*(1), 108-118. doi:10.1037/tps0000140

Shuli, Y., Clemens, R., Hongmei, Y., Xiaoming, L., Stanton, B., Deveaux, L., & ... Harris, C. (2006). YOUTH AND PARENTAL PERCEPTIONS OF PARENTAL MONITORING AND PARENT-ADOLESCENT COMMUNICATION, YOUTH DEPRESSION, AND YOUTH RISK BEHAVIORS. *Social Behavior & Personality: An International Journal*, *34*(10), 1297-1310.

Simpson, P. L., Schumaker, J. F., Dorahy, M. J., & Shrestha, S. N. (1996). Depression and life satisfaction in Nepal and Australia. *The Journal Of Social Psychology*, *136*(6), 783-790.

Slobodskaya, H. R., & Semenova, N. B. (2016). Child and adolescent mental health problems in Tyva Republic, Russia, as possible risk factors for a high suicide rate. *European Child & Adolescent Psychiatry*, *25*(4), 361-371. doi:10.1007/s00787-015-0743-z

Soyibo, K., & Lee, M. (1999). Use of illicit drugs among high-school students in Jamaica. *Bulletin Of The World Health Organization*, *77*(3), 258-262.

Srinath, S., Girimaji, S. C., Gururaj, G., Seshadri, S., Subbakrishna, D. K., Bhola, P., & Kumar, N. (2005). Epidemiological study of child & adolescent psychiatric disorders in urban & rural areas of Bangalore, India. *The Indian Journal Of Medical Research*, *122*(1), 67-79.

Steinberg, L. (2012). Should the Science of Adolescent Brain Development Inform Public Policy?. *Issues In Science & Technology*, *28*(3), 67-78.

Sussman, S., Skara, S., & Ames, S. L. (2008). Substance Abuse Among Adolescents. *Substance Use & Misuse*, *43*(12/13), 1802-1828.

Svedin, C. G., Nilsson, D., & Lindell, C. (2004). Traumatic experiences and dissociative symptoms among Swedish adolescents. A pilot study using Dis-Q-Sweden. *Nordic Journal Of Psychiatry*, *58*(5), 349-355. doi:10.1080/08039480410005891

Taskila, T., Steadman, K., Gulliford, J., Thomas, R., Elston, R., & Bevan, S. (2014). Working with schizophrenia: Experts' views on barriers and pathways to employment and job retention. *Journal Of Vocational Rehabilitation*, *41*(1), 29-44. doi:10.3233/JVR-140696

The ICD-10 classification of mental and behavioural disorders: Diagnostic criteria for research. (2003). Geneva: World Health Organization.

Toussaint, L., Wilson, C., Wilson, L., Williams, D., Wilson, C. M., Wilson, L. C., & Williams, D. R. (2015). Religiousness and suicide in a nationally representative sample of Trinidad and Tobago adolescents and young adults. *Social Psychiatry & Psychiatric Epidemiology*, *50*(9), 1441-1450.

Townsend, L. L., Esquivel, M. M., Uribe-Leitz, T., Weiser, T. G., Maggio, P. M., Spain, D. A., & ... Staudenmayer, K. (2017). The prevalence of psychiatric diagnoses and associated mortality

in hospitalized US trauma patients. *The Journal Of Surgical Research*, *213*171-176. doi:10.1016/j.jss.2017.02.014.

Unger, J. B. (2001). Stressful Life Events Among Adolescents in Wuhan, China: Associations With Smoking, Alcohol Use, and Depressive Symptoms. *International Journal Of Behavioral Medicine*, *8*(1), 1.

UNICEF. (2012, April). Progress for children: A report card on adolescents. Retrieved June 2, 2018, from https://www.unicef.org/publications/files/Progress_for_Children_-_No._10_EN_04272012.pdf

Van Droogenbroeck, F., Spruyt, B., & Keppens, G. (2018). Gender differences in mental health problems among adolescents and the role of social support: results from the Belgian health interview surveys 2008 and 2013. *BMC Psychiatry*, *18*1-9. doi:10.1186/s12888-018-1591-4

Veldman, K., Bültmann, U., Stewart, R. E., Ormel, J., Verhulst, F. C., & Reijneveld, S. A. (2014). Mental Health Problems and Educational Attainment in Adolescence: 9-Year Follow-Up of the TRAILS Study. *Plos ONE*, *9*(7), 1-7. doi:10.1371/journal.pone.0101751

Wartberg, L., Kriston, L., Kramer, M., Schwedler, A., Lincoln, T., & Kammerl, R. (2017). Original article: Internet gaming disorder in early adolescence: Associations with parental and adolescent mental health. *European Psychiatry*, *43*14-18. doi:10.1016/j.eurpsy.2016.12.013

WHO | Mental disorders. (2014, October 22). Retrieved from https://web.archive.org/web/20150518090215/http://www.who.int/mediacentre/factsheets/fs396/en/

Wolff, J., Heister, T., Normann, C., & Kaier, K. (2018). Hospital costs associated with psychiatric comorbidities: a retrospective study. *BMC Health Services Research*, *18*1-7. doi:10.1186/s12913-018-2892-5

World Economic Forum, the Harvard School of Public Health. *The global economic burden of non-communicable diseases.* Geneva, World Economic Forum, 2011

Yu, S., Clemens, R., Yang, H., Li, X., Stanton, B., Deveaux, L., . . . Harris, C. (2006). Youth And Parental Perceptions Of Parental Monitoring And Parent-Adolescent Communication, Youth Depression, And Youth Risk Behaviors. *Social Behavior and Personality: An International Journal, 34*(10), 1297-1310. doi:10.2224/sbp.2006.34.10.1297

Appendix A

ICD-10 codes

F00 Dementia in Alzheimer’s disease

F00.0 Dementia in Alzheimer's disease with early onset

F00.1 Dementia in Alzheimer's disease with late onset

F00.2 Dementia in Alzheimer's disease, atypical or mixed type

F00.8 Dementia in Alzheimer's disease, unspecified

F01 Vascular dementia

F01.0 Vascular dementia of acute onset

F01.1 Multi-infarct dementia

F01.2 Subcortical vascular dementia

F01.3 Mixed cortical and subcortical vascular dementia

F01.8 Other vascular dementia

F01.9 Vascular dementia, unspecified

F02 Dementia in other diseases classified elsewhere

F02.0 Dementia in Pick's disease

F02.1 Dementia in Creutzfeldt-Jakob disease

F02.2 Dementia in Huntington's disease

F02.3 Dementia in Parkinson's disease

F02.4 Dementia in human immunodeficiency virus [HIV] disease

F02.8 Dementia in other specified diseases classified elsewhere

F03 Unspecified dementia

F04 Organic amnesic syndrome not induced by alcohol and other psychoactive substances

F05 Delirium not induced by alcohol and other psychoactive substances

F05.0 Delirium, not superimposed on dementia, so described

F05.1 Delirium, superimposed on dementia

F05.8 Other delirium

F05.9 Delirium, unspecified

F06 Other mental disorders due to brain damage and dysfunction and to physical disease

F06.0 Organic hallucinosis

F06.1 Organic catatonic disorder

F06.2 Organic delusional [schizophrenia-like] disorder

F06.3 Organic mood [affective] disorder

F06.4 Organic anxiety disorder

F06.5 Organic dissociative disorder

F06.6 Organic emotionally labile [asthenic] disorder

F06.7 Mild cognitive disorder

F06.8 Other specified mental disorders due to brain damage and dysfunction and to physical disease

F06.9 Unspecified mental disorder due to brain damage and dysfunction and to physical disease

F07 Personality and behavioral disorders due to brain disease, damage and dysfunction

F07.0 Organic personality disorder

F07.1 Postencephalitic syndrome

F07.2 Postconcussional syndrome

F07.8 Other organic personality and behavioral disorders due to brain disease, damage and dysfunction

F07.9 Unspecified mental disorder due to brain disease, damage and dysfunction

F09 Unspecified organic or symptomatic mental disorder

F10 Mental and behavioral disorders due to use of alcohol

F11 Mental and behavioral disorders due to use of opioids

F12 Mental and behavioral disorders due to cannabinoids

F13 Mental and behavioral disorders due to use of sedatives or hypnotics

F14 Mental and behavioral disorders due to use of cocaine

F15 Mental and behavioral disorders due to use of other stimulants, including caffeine

F16 Mental and behavioral disorders due to use of hallucinogens

F17 Mental and behavioral disorders due to use of tobacco

F18 Mental and behavioral disorders due to use of volatile solvents

F19 Mental and behavioral disorders due to multiple drug use and use of other psychoactive substances

F20 Schizophrenia

F20.0 Paranoid schizophrenia

F20.1 Hebephrenic schizophrenia

F20.2 Catatonic schizophrenia

F20.3 Undifferentiated schizophrenia

F20.4 Post-schizophrenic depression

F20.5 Residual schizophrenia

F20.6 Simple schizophrenia

F20.8 Other schizophrenia

F20.9 Schizophrenia, unspecified

F21 Schizotypal disorders

F22 Persistent delusional disorders

F22.0 Delusional disorder

F22.8 Other persistent delusional disorders

F22.9 Persistent delusional disorder, unspecified

F23 Acute and transient psychotic disorders

F23.0 Acute polymorphic psychotic disorder without symptoms of schizophrenia

F23.1 Acute polymorphic psychotic disorder with symptoms of schizophrenia

F23.2 Acute schizophrenia-like psychotic disorder

F23.3 Other acute predominantly delusional psychotic disorder

F23.8 Other acute and transient psychotic disorders

F23.9 Acute and transient psychotic disorder, unspecified

F24 Induced delusional disorders

F25 schizoaffective disorders

F25.0 Schizoaffective disorder, manic type

F25.1 Schizoaffective disorder, depressive type

F25.2 Schizoaffective disorder, mixed type

F25.8 Other schizoaffective disorders

F25.9 Schizoaffective disorder, unspecified

F28 Other nonorganic psychotic disorders

F29 Unspecified nonorganic psychosis

F30 Manic episode

F30.0 Hypomania

F30.1 Mania without psychotic symptoms

F30.2 Mania with psychotic symptoms

F30.8 Other manic episodes

F30.9 Manic episode, unspecified

F31 Bipolar affective disorder

F31.0 Bipolar affective disorder, current episode hypomanic

F31.1 Bipolar affective disorder, current episode manic without psychotic symptoms

F31.2 Bipolar affective disorder, current episode manic with psychotic symptoms

F31.3 Bipolar affective disorder, current episode mild or moderate depression

F31.4 Bipolar affective disorder, current episode severe depression without psychotic symptoms F31.5 Bipolar affective disorder, current episode severe depression with psychotic symptoms

F31.6 Bipolar affective disorder, current episode mixed

F31.7 Bipolar affective disorder, currently in remission

F31.8 Other bipolar affective disorders

F31.9 Bipolar affective disorder, unspecified

F32 Depressive episode

F32.0 Mild depressive episode

F32.1 Moderate depressive episode

F32.2 Severe depressive episode without psychotic symptoms

F32.3 Severe depressive episode with psychotic symptoms

F32.8 Other depressive episodes

F32.9 Depressive episode, unspecified

F33 Recurrent depressive disorder

F33.0 Recurrent depressive disorder, current episode mild

F33.1 Recurrent depressive disorder, current episode moderate

F33.2 Recurrent depressive disorder, current episode severe without psychotic symptoms

F33.3 Recurrent depressive disorder, current episode severe with psychotic symptoms

F33.4 Recurrent depressive disorder, currently in remission

F33.8 Other recurrent depressive disorders

F33.9 Recurrent depressive disorder, unspecified

F34 Persistent mood (affective) disorders

F34.0 Cyclothymia

F34.1 Dysthymia

F34.8 Other persistent mood [affective] disorders

F34.9 Persistent mood [affective] disorder, unspecified

F38 Other mood (affective) disorders

F38.0 Other single mood [affective] disorder

F38.1 Other recurrent mood [affective] disorders

F38.8 Other specified mood [affective] disorders

F39 Unspecified mood (affective) disorder

F40 Phobic anxiety disorders

F40.0 Agoraphobia

F40.1 Social phobias

F40.2 Specific (isolated) phobias

F40.8 Other phobic anxiety disorders

F40.9 Phobic anxiety disorder, unspecified

F41 Other anxiety disorders

F41.0 Panic disorder [episodic paroxysmal anxiety]

F41.1 Generalized anxiety disorder

F41.2 Mixed anxiety and depressive disorder

F41.3 Other mixed anxiety disorders

F41.8 Other specified anxiety disorders

F41.9 Anxiety disorder, unspecified

F42 Obsessive-compulsive disorders

F42.0 Predominantly obsessional thoughts or ruminations

F42.1 Predominantly compulsive acts [obsessional rituals]

F42.2 Mixed obsessional thoughts and acts

F42.8 Other obsessive-compulsive disorders

F42.9 Obsessive-compulsive disorder, unspecified

F43 Reaction to severe stress, and adjustment disorders

F43.0 Acute stress reaction .00 Mild .01 Moderate .02 Severe

F43.1 Post-traumatic stress disorder

F43.2 Adjustment disorders

F43.8 Other reactions to severe stress

F43.9 Reaction to severe stress, unspecified

F44 Dissociative (conversion) disorders

F44.0 Dissociative amnesia

F44.1 Dissociative fugue

F44.2 Dissociative stupor

F44.3 Trance and possession disorders

F44.4 Dissociate motor disorders

F44.5 Dissociative convulsions

F44.6 Dissociate anesthesia and sensory loss

F44.7 Mixed dissociative [conversion] disorders

F44.8 Other dissociative [conversion] disorders

F44.9 Dissociative [conversion] disorder, unspecified

F45 Somatoform disorders

F45.0 Somatization disorder

F45.1 Undifferentiated somatoform disorder

F45.2 Hypochondriacal disorders

F45.3 Somatoform autonomic dysfunction

F45.4 Persistent somatoform pain disorder

F45.8 Other somatoform disorders

F45.9 Somatoform disorder, unspecified

F48 Other neurotic disorders

F48.0 Neurasthenia

F48.1 Depersonalization-derealization syndrome

F48.8 Other specified neurotic disorders

F48.9 Neurotic disorder, unspecified

F50 Eating disorders

- F50.0 Anorexia nervosa
- F50.1 Atypical anorexia nervosa
- F50.2 Bulimia nervosa
- F50.3 Atypical bulimia nervosa
- F50.4 Overeating associated with other psychological disturbances
- F50.5 Vomiting associated with other psychological disturbances
- F50.8 Other eating disorders
- F50.9 Eating disorder, unspecified

F51 Nonorganic sleep disorders

- F51.0 Nonorganic insomnia
- F51.1 Nonorganic hypersomnia
- F51.2 Nonorganic disorder of the sleep-wake schedule
- F51.3 Sleepwalking [somnambulism]
- F51.4 Sleep terrors [night terrors]
- F51.5 Nightmares
- F51.8 Other nonorganic sleep disorders
- F51.9 Nonorganic sleep disorder, unspecified

F52 Sexual dysfunction not caused by organic disorders or disease

- F52.0 Lack or loss of sexual desire
- F52.1 Sexual aversion and lack of sexual enjoyment
- F52.2 Failure of genital response
- F52.3 Orgasmic dysfunction

F52.4 Premature ejaculation

F52.5 Nonorganic vaginismus

F52.6 Nonorganic dyspareunia

F52.7 Excessive sexual drive

F52.8 Other sexual dysfunction, not caused by organic disorder or disease

F52.9 Unspecified sexual dysfunction, not caused by organic disorder or disease

F53 Mental and behavioral disorders associated with the puerperium, not elsewhere classified

F53.0 Mild mental and behavioural disorders associated with the puerperium, not elsewhere classified

F53.1 Severe mental and behavioural disorders associated with the puerperium, not elsewhere classified

F53.8 Other mental and behavioural disorders associated with the puerperium, not elsewhere classified

F53.9 Puerperal mental disorder, unspecified

F54 Psychological and behavioral factors associated with disorders or diseases classified elsewhere

F55 Abuse of non-dependence-producing substances

F55.0 Antidepressants

F55.1 Laxatives

F55.2 Analgesics

F55.3 Antacids

F55.4 Vitamins

F55.5 Steroids or hormones

F55.6 Specific herbal or folk remedies

F55.8 Other substances that do not produce dependence

F55.9 Unspecified

F59 Unspecified behavioral syndromes associated with physiological disturbances and physical factors

F60 Specific personality disorders

F60.0 Paranoid personality disorder

F60.1 Schizoid personality disorder

F60.2 Dissocial personality disorder

F60.3 Emotionally unstable personality disorder

F60.4 Histrionic personality disorder

F60.5 Anankastic personality disorder

F60.6 Anxious [avoidant] personality disorder

F60.8 Other specific personality disorders

F60.9 Personality disorder, unspecified

F61 Mixed and other personality disorders

F61.0 Mixed personality disorder

F61.1 Troublesome personality changes

F62 Enduring personality changes, not attributable to brain damage and disease

F62.0 Enduring personality change after catastrophic experience

F62.1 Enduring personality change after psychiatric illness

F62.8 Other enduring personality changes

F62.9 Enduring personality change, unspecified

F63 Habit and impulse disorders

F63.0 Pathological gambling

F63.1 Pathological fire-setting [pyromania]

F63.2 Pathological stealing [kleptomania]

F63.3 Trichotillomania

F63.8 Other habit and impulse disorders

F63.9 Habit and impulse disorder, unspecified

F64 Gender identity disorders

F64.0 Transsexualism

F64.1 Dual-role transvestism

F64.2 Gender identity disorder of childhood

F64.8 Other gender identity disorders

F64.9 Gender identity disorder, unspecified

F65 Disorders of sexual preference

F65.0 Fetishism

F65.1 Fetishistic transvestism

F65.2 Exhibitionism

F65.3 Voyeurism

F65.4 Paedophilia

F65.5 Sadomasochism

F65.6 Multiple disorders of sexual preference

F65.8 Other disorders of sexual preference

F65.9 Disorder of sexual preference, unspecified

F66 Psychological and behavioral disorders associated with sexual development and orientation

F66.0 Sexual maturation disorder

F66.1 Egodystonic sexual orientation

F66.2 Sexual relationship disorder

F66.8 Other psychosexual development disorders

F66.9 Psychosexual development disorder, unspecified

F68 Other disorders of adult personality and behavior

F68.0 Elaboration of physical symptoms for psychological reasons

F68.1 Intentional production or feigning of symptoms or disabilities, either physical or psychological [factitious disorder]

F68.8 Other specified disorders of adult personality and behavior

F69 Unspecified disorders of adult personality and behavior

F70 Mild mental retardation

F71 Moderate mental retardation

F72 Severe mental retardation

F73 Profound mental retardation

F78 Other mental retardation

F79 Unspecified mental retardation

F80 Specific developmental disorders of speech and language

F80.0 Specific speech articulation disorder

F80.1 Expressive language disorder

F80.2 Receptive language disorder

F80.3 Acquire aphasia with epilepsy [Landau-Kleffner syndrome]

F80.8 Other developmental disorders of speech and language

F80.9 Developmental disorder of speech and language, unspecified

F81 Specific developmental disorders of scholastic skills

F81.0 Specific reading disorder

F81.1 Specific spelling disorder

F81.2 Specific disorder of arithmetical skills

F81.3 Mixed disorder of scholastic skills

F81.8 Other developmental disorders of scholastic skills

F81.9 Developmental disorder of scholastic skills, unspecified

F82 Specific developmental disorders of motor function

F83 Mixed specific developmental disorders

F84 Pervasive developmental disorders

F84.0 Childhood autism

F84.1 Atypical autism

F84.2 Rett's syndrome

F84.3 Other childhood disintegrative disorder

F84.4 Overactive disorder associated with mental retardation and stereotyped movements

F84.5 Asperger's syndrome

F84.8 Other pervasive developmental disorders

F84.9 Pervasive developmental disorder, unspecified

F88 Other disorders of psychological development

F89 Unspecified disorders of psychological development

F90 Hyperkinetic disorders

F90.0 Disturbance of activity and attention

F90.1 Hyperkinetic conduct disorder

F90.8 Other hyperkinetic disorders

F90.9 Hyperkinetic disorder, unspecified

F91 Conduct disorders

F91.0 Conduct disorder confined to the family context

F91.1 Unsocialized conduct disorder

F91.2 Socialized conduct disorder

F91.3 Oppositional defiant disorder

F91.8 Other conduct disorders

F91.9 Conduct disorder, unspecified

F92 Mixed disorders of conduct and emotions

F92.0 Depressive conduct disorder

F92.8 Other mixed disorders of conduct and emotions

F92.9 Mixed disorder of conduct and emotions, unspecified

F93 Emotional disorders with onset specific to childhood

F93.0 Separation anxiety disorder of childhood

F93.1 Phobic anxiety disorder of childhood

F93.2 Social anxiety disorder of childhood

F93.3 Sibling rivalry disorder

F93.8 Other childhood emotional disorders

F93.9 Childhood emotional disorder, unspecified

F94 Disorders of social functioning with onset specific to childhood and adolescence

F94.0 Elective mutism

F94.1 Reactive attachment disorder of childhood

F94.2 Disinhibited attachment disorder of childhood

F94.8 Other childhood disorders of social functioning

F94.9 Childhood disorder of social functioning, unspecified

F95 Tic disorders

F95.0 Transient tic disorders

F95.1 Chronic motor or vocal tic disorder

F95.2 Combined motor and vocal tic disorder [de la Tourette's syndrome]

F95.8 Other tic disorders

F95.9 Tic disorder, unspecified

F98 Other behavioral and emotional disorders with onset usually occurring in childhood and adolescence

F98.0 Nonorganic enuresis .00 Nocturnal enuresis only .01 Diurnal enuresis only .02 Nocturnal and diurnal enuresis

F98.1 Nonorganic encopresis

F98.2 Feeding disorder of infancy and childhood

F98.3 Pica of infancy and childhood

F98.4 Stereotyped movement disorders .40 Non-self-injurious .41 Self-injurious .42 Mixed

F98.5 Stuttering [stammering]

F98.6 Cluttering

F98.8 Other specified behavioral and emotional disorders with onset usually occurring in childhood and adolescence

F98.9 Unspecified behavioral and emotional disorders with onset usually occurring in childhood and adolescence

F99 Mental disorders not otherwise specified